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Number 4.

APRIL, 1902

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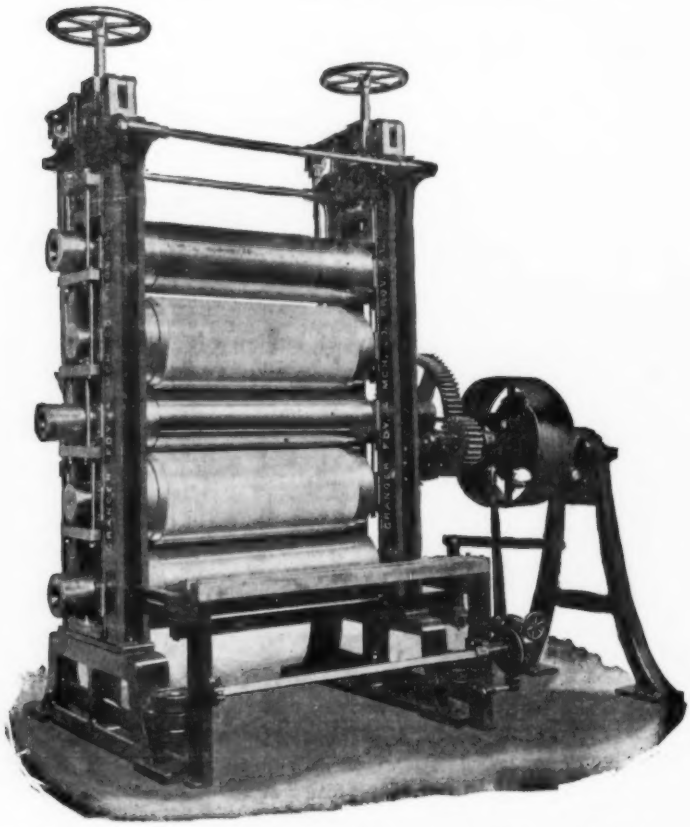

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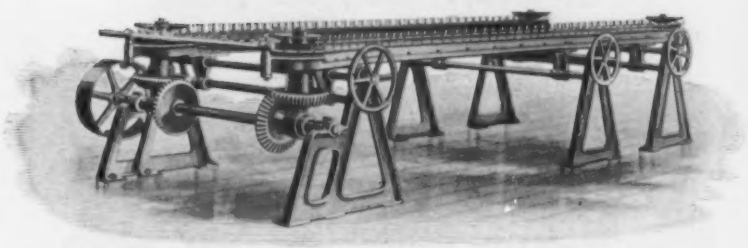

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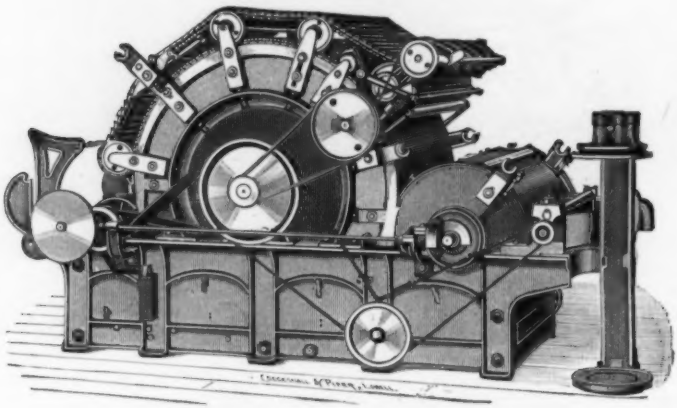

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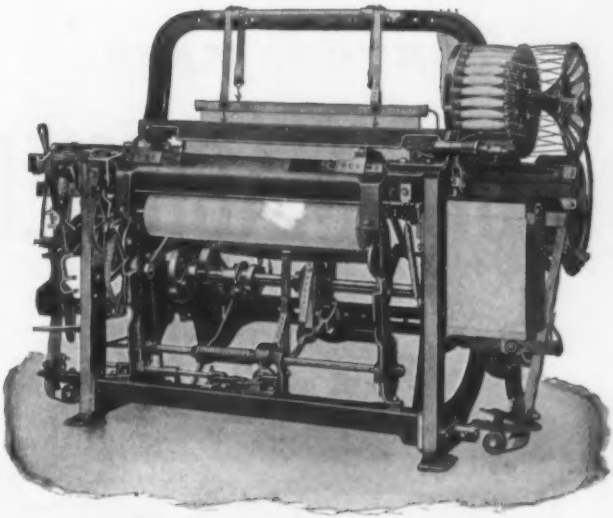

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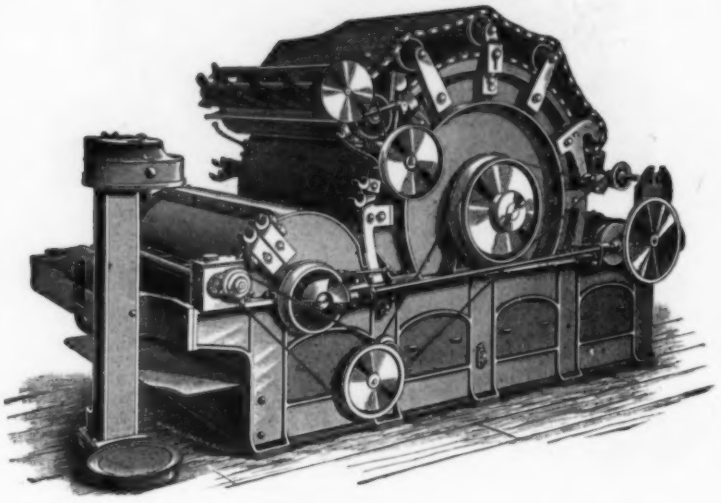

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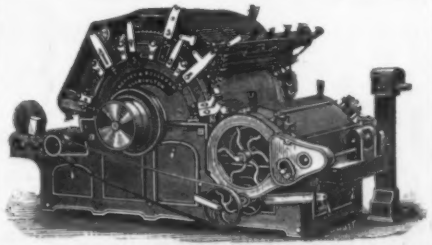

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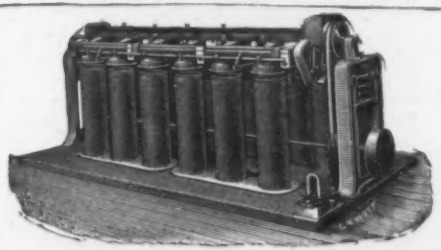

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All parts of above machines are made by special tools and are exact duplicates.

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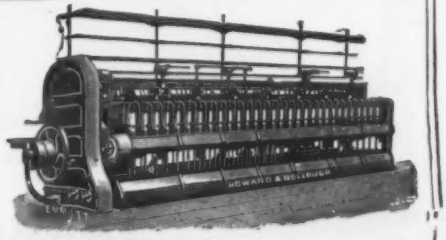

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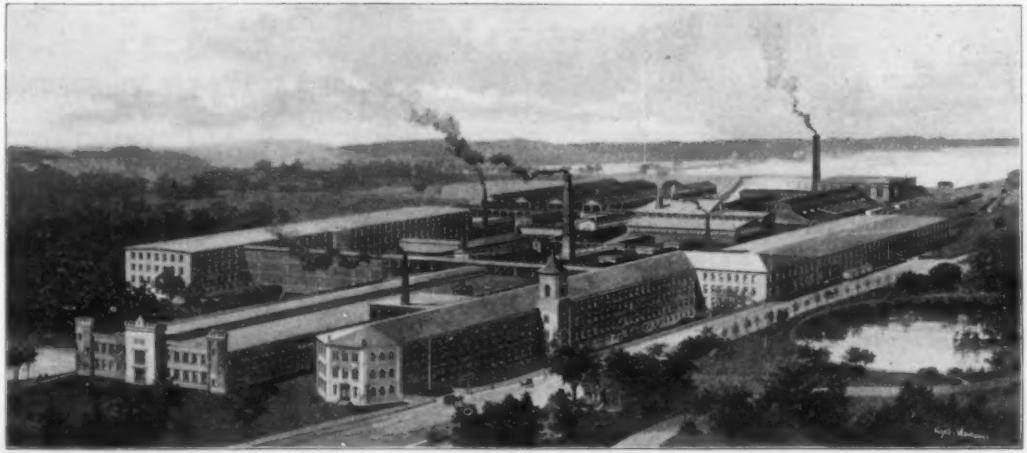

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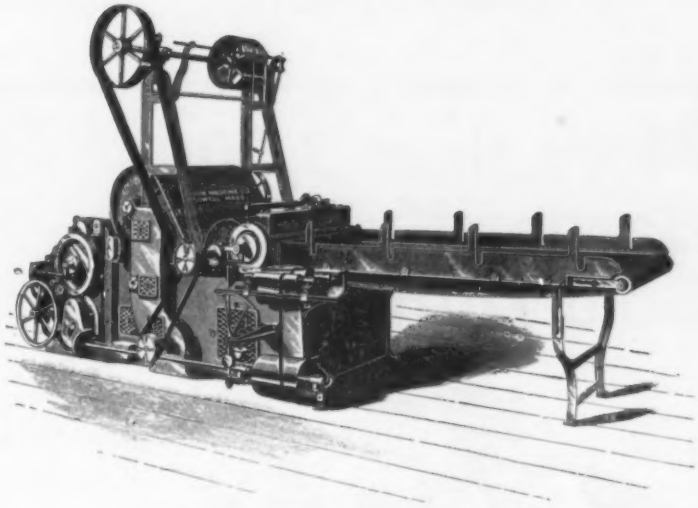

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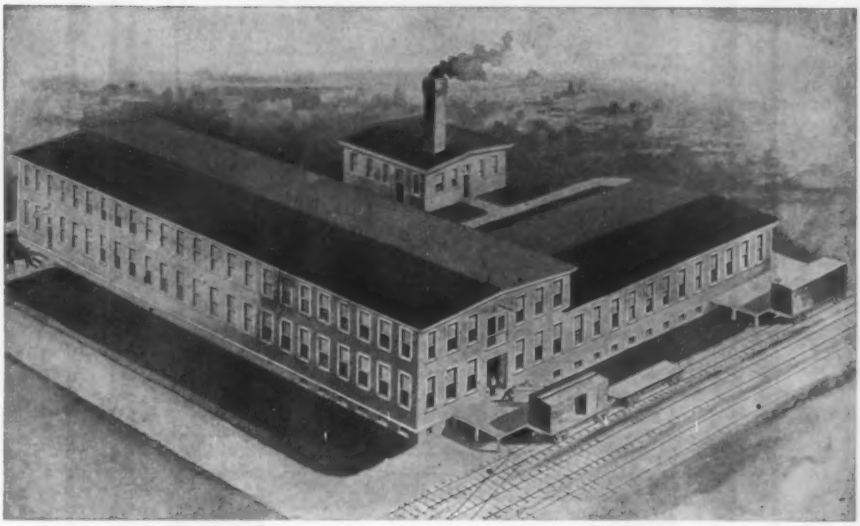

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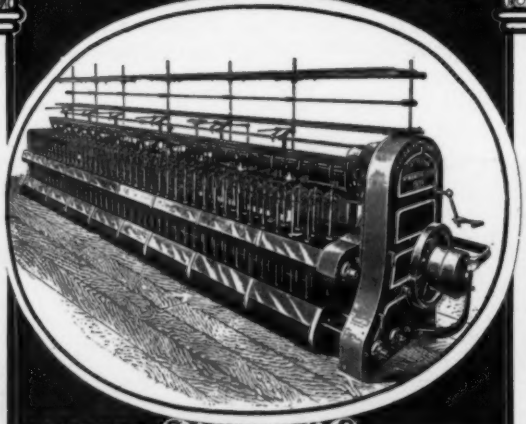

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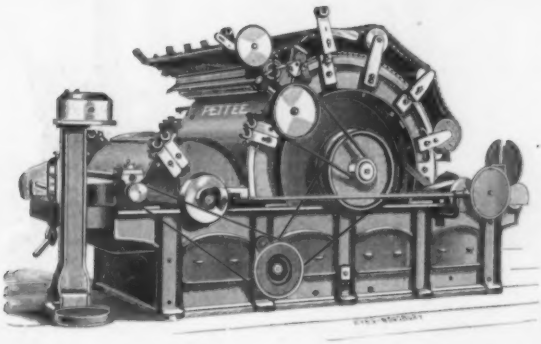

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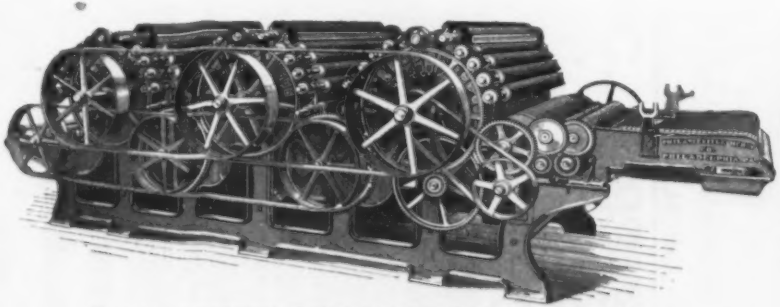

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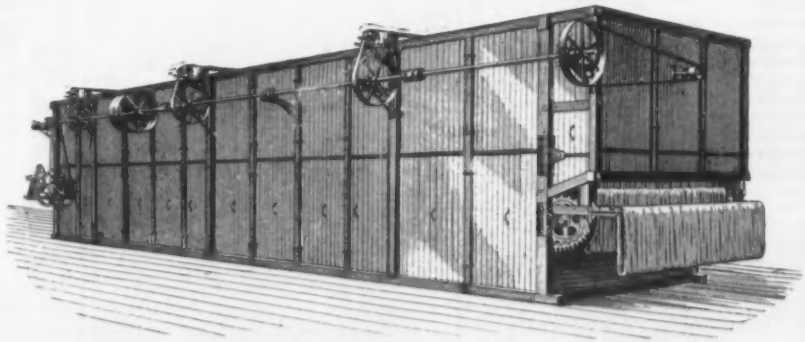

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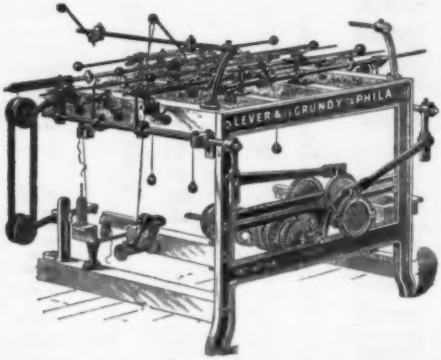

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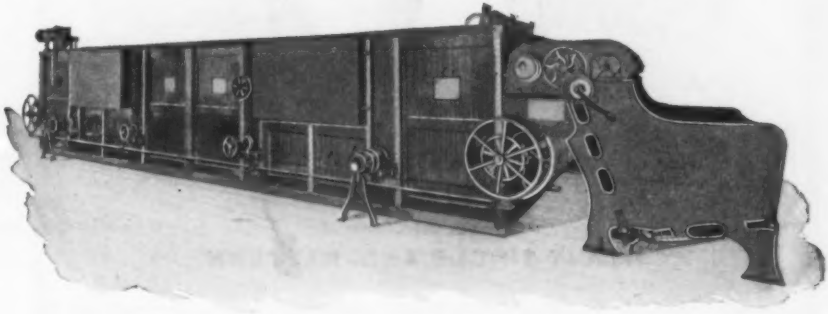

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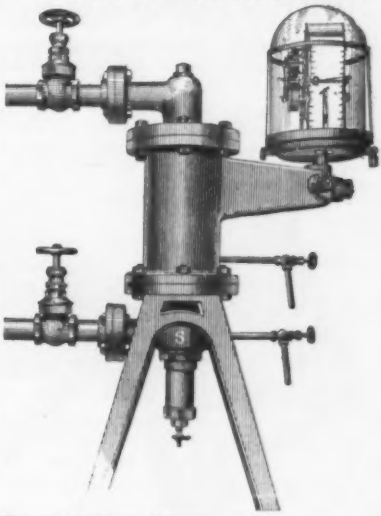

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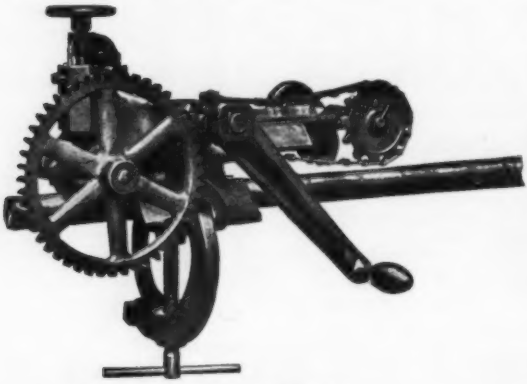

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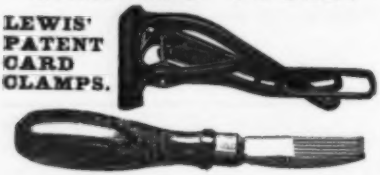
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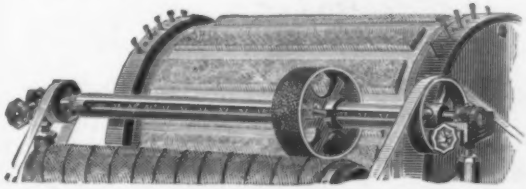

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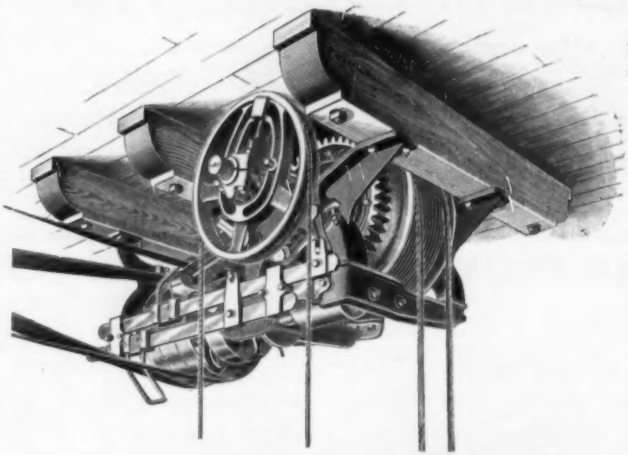

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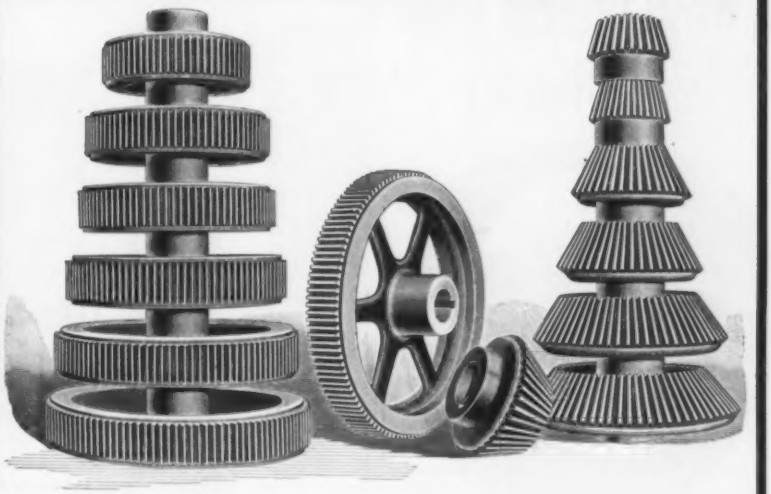

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It does four things never successfully done before:

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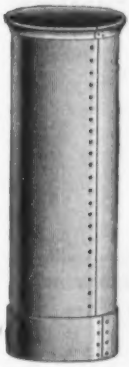

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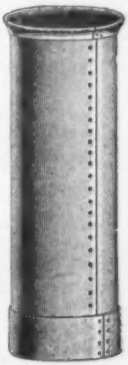

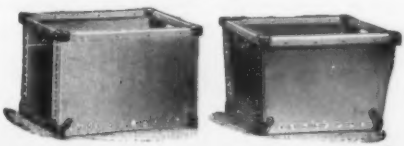

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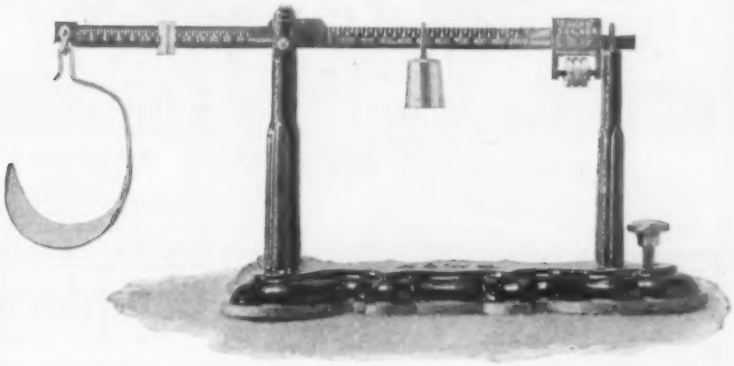
That will weigh by HALF GRAINS up to 1,000 GRAINS (over 2 1-4 oz.)



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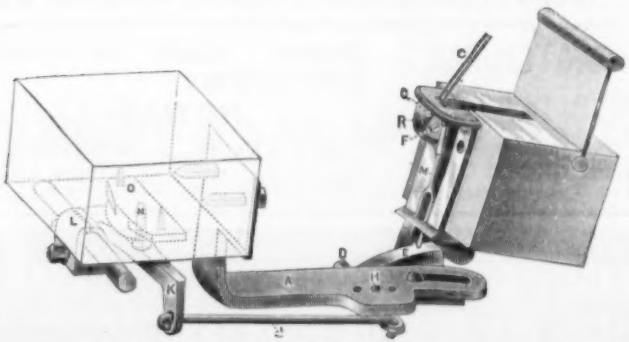
TUCKER'S STOP MOTION.

Especially for Woolen Goods. The best Stop Motion ever put on a loom.



We are still making this stop motion and carry a full line of detail parts for repairs. We can and do promptly fill all orders for repairs or new stop motions.

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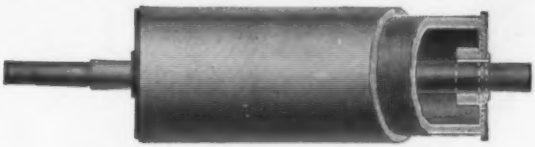

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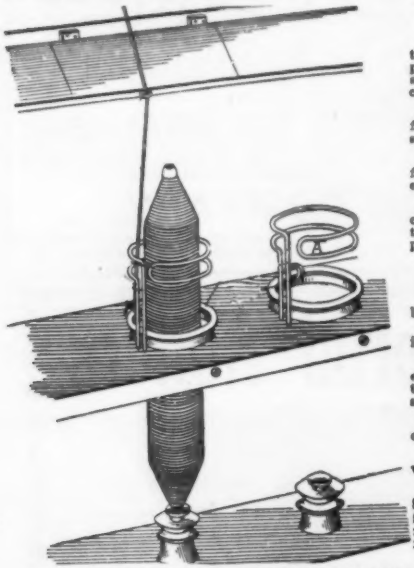
BEST OAK BELTING.

PHILADELPHIA.

New Thread Protector for Ring Spinning



The following advantages are claimed for this protector.

1. The speed of the frame will be increased, and also the production; on frames without any protectors or plate separators about twenty-five to thirty per centum, and on frames with separators about twelve or fifteen per centum.

2. The threshing and consequent imperfection and inferiority of yarn and cloth, occasioned by the use of blade separators is entirely obviated.

3. The traverse of the rail can be increased from one-fourth of an inch to one inch, if frame permits, thereby enabling the use of longer bobbins.

4. The life of the traveller is prolonged fully fifty per cent on account of a more even tension being imparted to the traveller, the same being held in a perpendicular position at all points of the traverse,

5. Frame and rail more perfectly balanced.

6. Heavier travelers can be used.

7. The yarn is wound tighter and more uniformly on bobbins.

8. A material saving in time of doffing, as more yarn is wound on, and longer bobbins can be used.

9. Saving of time of the operator on account of fewer ends breaking, thereby increasing the quality of yarn, and the operator can attend many more spindles in consequence.

10. The life of the ring will be prolonged on account of decreased friction.

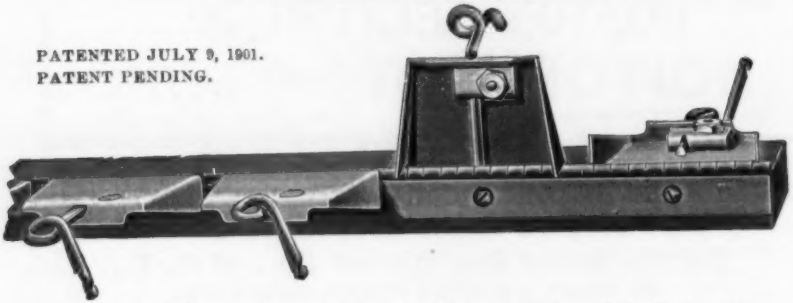
11. No accumulation of lint, dust and dirt, which invariably results in the use of blade separators.

The above results have been obtained in the mills of S Sanford & Sons, Carpet Manufacturers, Amsterdam, N.Y. in whose mills the protectors have been in use on all spinning frames since October, 1909, and by permission we refer to said firm for a confirmation of our claims.

THE RING FRAME THREAD PROTECTOR CO., Amsterdam, N. Y.
Southern Office: 40 Tryon St., Charlotte, N. C., S. J. Smith & Co., Agents.

HOUGHTON'S
All Steel Thread Board
WITH
Hardened Thread Guides.
7 1-2 CENTS PER SPINDLE.

PATENTED JULY 9, 1901.
PATENT PENDING.



The only Thread Board that *holds a guide solid* all the time; *never* gets loose. Saves "broken ends" because it is never out of adjustment. It is *always right.*

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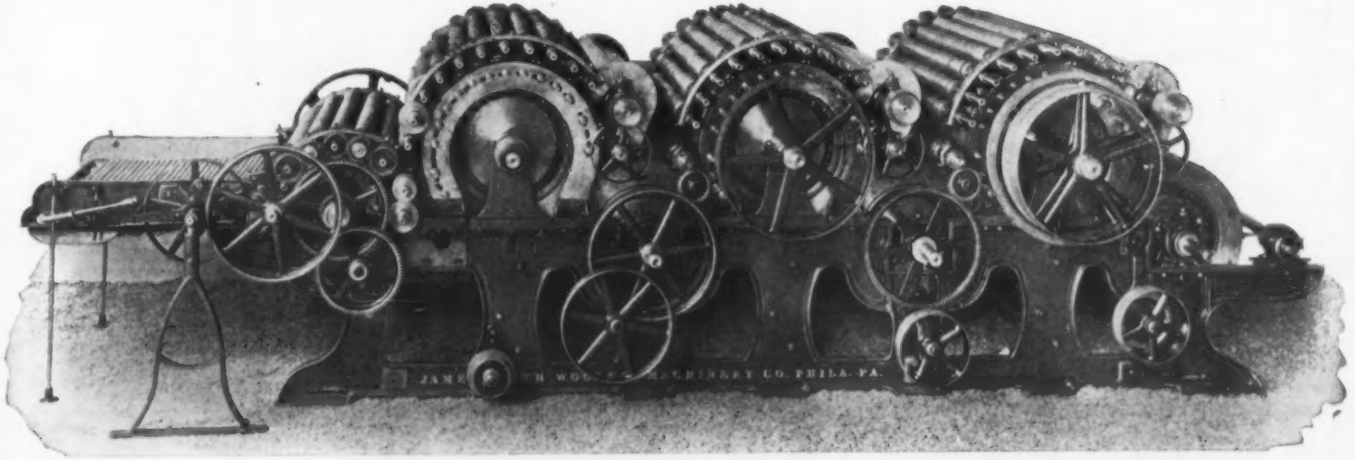

SMITH'S IMPROVED GARNETT MACHINE.

GARNETT MACHINES.

Garnett Machines for opening Worsted Thread Waste, cotton cop yarns, re working hosiery clips and waste, and shoddy work in general; Garnett Pickers; Metallic Breasts of every description; Feed Rolls, Lickerins and Burring machihes; Reclothing, and every character of Metallic Work.

SELF FEEDERS.

Improved Automatic Self-weighing Feeders for First Breaker Cards and Garnetts; also Self-Feeders for Wool and Mixing Pickers, Burr Pickers; Wool Washers, etc.; Apperly Feeds and Blamire Lap Feeds.

ENTIRE MACHINERY EQUIPMENT FOR THE MANUFACTURE OF COTTON BATTING for Commercial Batts, Comforters, Mattresses, Carpet Lining, Stair Pads, etc.

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Cards of every description, special attention being called to our Twentieth Century Card.

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Self acting,—of both English and American pattern.

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Wool, Burr and Rag Pickers, and Lumpers.

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Cone Willows, Square Willows and Dusters

RING TWISTERS; AUTOMATIC BLOCK SPOOLERS; WARP SPOOLERS AND DRESSERS.
WOOL WASHING and SOURING MACHINERY.
GRINDERS FOR CARDS AND METALLIC WORK IN GENERAL.

Complete WOOLEN and WORSTED Mill equipment up to and including spinning.

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Power Transmission material of every character; Friction Clutches; Shafting; Hangers; Pulleys, etc.

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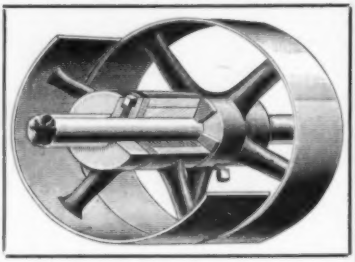

You don't want friction,
You don't want oil,

but you stand the nuisance of oil, in order to lessen friction—and so you get *both*.

Use Arguto Oilless Bearings and get rid of both.

They're unequalled for loose pulleys and light shafting.

It costs nothing to try them. Send us size of shaft and we will send you a bearing for trial FREE, if you men tion this paper.

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IMPROVED SPINNING AND TWISTING MACHINERY,
For Hard or Soft Twines, Lines, Cordage, etc.
of Sisal, Manila, Cotton, Linen, Hemp, Jute, Silk, Hair Paper, or Wire.

Write for particulars in regard to our new machine for spinning heavy Cotton Yarn direct from Drawing Sliver for Cotton Rope, etc.

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THUN & JANSSEN, Reading, Pa.
Manufacturers of
BRAIDING MACHINES OF SUPERIOR QUALITY
for making Dress Trimming Braids, Cotton Tapes, Underwear Braids, Shoe Laces, Spindle Banding, etc. Winders, **Doublers**, Measuring Machines, Reelers, Singeing and Finishing Machinery. Special machinery.

Here Is a Letter Worth Reading.

ALBANY, N. Y., Mar. 5, 1902.

GUILD & LORD,
Publishers Textile World.

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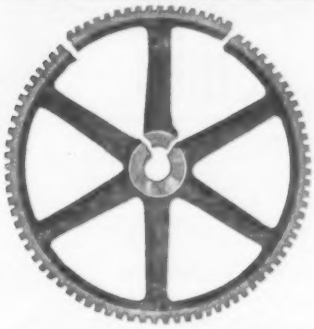

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BRANCH OFFICES:
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List of Textile Patents.

Issued Feb. 25, March 4, 11, 18, 25.

Attachment for Knitting Machine. 694,195. Robert Rholeder, Troy, N. Y., assignor of one-half to Alfred Bafe, Troy, N. Y.

Apparatus for Mercerizing. 694,109. Albert Roemer, Oberdollendorf on the Rhine, Germany.

Appliance for Beating up the Weft in Looms. 696,263. Heinrich Panitshek and Carl Herold Bruenn, Austria, Hungary.

Bobbin Holder for Circular Looms. 694,128. Charles N. Brown, Boston, Mass., assignor of one-half to Jas. S. Wilson, Chelsea, Mass.

Board for Holding and Shipping Cloth. 695,062. John Lonke, New York, N. Y.

Braiding Machine. 695,469. Frank Meyer, Paterson, N. J.

Braiding Machine. 695,601. Albert B. Diss, Brooklyn, N. Y., assignor to United States Braid Machine Mfg. Co., Newark, N. J., a corporation of New Jersey.

Braiding Machine. 695,746. Jacob Lundoren, Philadelphia, Pa., assignor to Henry M. Harley, Gloucester City, N. J.

Braiding Machine. 696,094. Albert B. Diss, Brooklyn, N. Y., assignor to the United States Braid Manufacturing Co., Newark, N. J., a corporation of New Jersey.

Bobbin-Holder. 696,082. Orrin M. Rolfe, Lowell, Mass.

Circular Knitting Machine. 694,382. Harry A. Houseman, Philadelphia, Pa., assignor to the Standard Machine Company, a corporation of Pennsylvania.

Dyeing Apparatus. 698,737. Joseph Hussong, Camden, N. J.

Electric Filling Changing Mechanism for Looms. 695,363. Frederick M. Armstrong, Pawtucket, R. I., and John A. Clark, Worcester, Mass., assignors to the Crompton & Knowles Works, Worcester, Mass., a corporation of Rhode Island.

Electric Weft Indicator Mechanism for Looms. 694,961. Stephen M. Hamblin, Central Falls, R. I., assignor to Harry W. Smith, Worcester, Mass.

Feeding Device for Fabric Cutting Machines. 693,922. Clarence Stone, Philadelphia, Pa., assignor to the Adams Top Cutting Machine Company, New York, N. Y.

Filling-Replenishing Mechanism for Looms. 695,040. Clare H. Draper and E. S. Stimpson, Hopedale, Mass., assignors to the Draper Company, Hopedale, Mass., a corporation of Maine.

Filling-Replenishing Mechanism for Looms. 695,045. Joseph A. G. Gould, Montreal, Canada, assignors to the Draper Company, Hopedale, Mass., a corporation of Maine.

Fabric-Cutting Machine. 695,553. John A. Heany, Philadelphia, Pa., assignor to the Adams Top Cutting Company, East Orange, N. J.

Flier. 694,876. Frederick A. Meller, Woonsocket, R. I., assignor of one-half to F. J. O'Reilly, Woonsocket, R. I.

Flier. 694,884. John McOsker, Woonsocket, R. I.

Hammock Loom. 695,792. Zebulon L. Chadbourne, New Brighton, N. Y.

Hackling Machine. 696,127. McClintock Young, Frederick, Md., assignor to the firm of Young and Robinson, Frederick, Md.

Knitting Machine. 694,036. W. G. Stewart, Philadelphia, Pa., assignor to F. B. Espen, W. G. Stewart and Herbert E. Loeb, Philadelphia, Pa. (co-partners trading as Espen, Stewart and Loeb, Ltd.)

Loom. 694,108. E. Nierhaus and P. Kaiser, Barmen, Germany.

Loom. 696,622. Charles J. Nauen, Paterson, N. J.

Loose-Reed Motion for Looms. 696,212. Alden B. Taplin, Keene, N. H.

Machine for Oxidizing Yarn. 696,032. John W. Fries, Winston Salem, N. C.

(Continued on page 754.)

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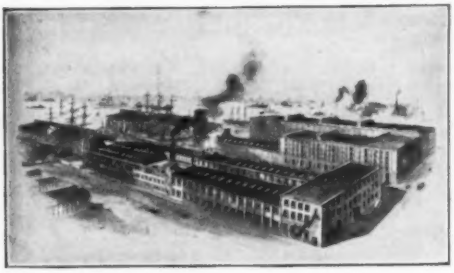

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TEXTILE WORLD.

Vol. XXII. APRIL, 1902. No. 4.

GEORGE E. WHITNEY.

For nearly fifty years the name of Whitney has been prominent in the woolen goods trade. Col. Geo. Whitney acquired the Bullock mill at South Royalston, Mass., near the middle of the last century, and for many years maintained its long established reputation for superiority in the manufacture of the highest grades of broadcloths, doeskins and tricots. It was his most cherished desire that his only son and child, the subject of this article, might succeed him in the business.

To this end every attention was given to his education, both in the common schools and under tutors and later in one of the leading business colleges.

Being thus prepared, he began his life work in his father's mill and, commencing at the very first process in the preparation of wool for manufacture, he thoroughly mastered all of them, completing his education in manufacturing in the mills of James Phillips, Jr., at Fitchburg, Mass.

When eighteen years of age he assumed the full management and very successfully operated his father's mill until it was burned in 1892. Under his management the line of goods made was changed to Irish friezes, chinchillas, overcoatings and fancy suitings, and he increased the product nearly threefold, doing all the designing, and also supervising the sale of the goods. After the fire, the business was continued in a leased mill at Fitchburg, for about a year. Mr. Whitney at the same time was agent of the Beoli Mills for James Phillips, Jr.

The manufacturing business was incorporated in 1890 as the Geo. Whitney Woolen Co. by Col. Whitney and his son, and in 1893 they bought the Greenbank mill at Enfield, N. H.; in the same year a yarn mill was built at South Royalston, on the site of the old stone mill.

In 1895, the Enfield mill company was organized by Mr. Whitney and a yarn mill built near his other mill and which he named the Baltic. Mr. Whitney devoted all his time and energy to these different mills until 1899, when he sold all his Enfield interests to the American Woolen Co.

Since that time, as agent, he has managed for that company its mills at Enfield, Lebanon and Burlington, Vt., and when the contemplated additions are completed, he will have under his direction 750 looms, 150 sets of cards, and 2000 employees, exclusive of his interest in the mills in Massachusetts operated by the Geo. Whitney Woolen Co., of which he is the president and treasurer.

Outside of these enterprises, he is a director in the Cotton & Woolen Manufacturers Insurance Co. and in the Whiting Mutual Ins. Co., both of Boston, has large interests in real estate and finds time to serve his town and state, having been a representative to the N. H. Legislature two years; other political honors are probably awaiting him.

Mr. Whitney is still a young man, being only 38 years of age. He is a 32 degree Mason and a Knight Templar. He has a beautiful home at Enfield, N. H., and with his gracious and accomplished wife, dispenses his hospitalities to all. He is a lover of horses as the many fine blooded ones

in his stables will prove, and thoroughly enjoys all the manly sports and games.

His many gifts to worthy objects prove his public spirit, notably, in the case of the new building in Enfield, the hall of which is named in his honor. He is one of the progressive men of the day and it is hoped that a long life is before him, for it is by such men as he that the industries of this county are built up and sustained.

CONTRASTS.

The textile industry during March, 1902, afforded some sharp and instructive contrasts. A strike in Greiz, Germany involved directly about 3000 weavers, and, as an indirect result, threw out of work many more than that number. The dispute was complicated and related to length of cuts, hours of labor and rate of wages. The operatives' demands as to working time were that the engine should not run over 11 hours per day, and that the actual working time should be limited to 10 hours, exclusive of the time allowed for breakfast and lunch. The mill owners refused point blank to concede these demands, on the grounds that it would place them at a great disadvantage with their competitors in other sections of Germany. The manufacturers expressed a willingness to make concessions as to length of warps, and also promised to consider a readjustment of the wage scale on new grades of goods, providing the strikers first returned to work.

In Germany there is a system of procedure authorized by law by which the court listens to representatives of both sides in a labor dispute, and then presents to each an official statement in which are pointed out possible terms of settlement. This official statement is then referred back to the operatives and mill owners for final decision. In the Greiz case the governmental proposals were at first rejected. The strike lasted over six weeks, and ended early in March without any substantial advantages having been gained by the operatives. Upon their return to work several of the largest employers presented each of the returning strikers with ten marks ($2.40) in cash. Whether this gift was a reward for striking during the busy season or a peace offering made to restore good feeling and lead the workers to extra exertions to make up for lost time, it is not stated. A German correspondent at Greiz states that the weekly wages of the 3000 striking weavers amounts to $10,000, or an average of $3.33 for each worker.

The wage agitation between the cotton mill operatives and mill owners of New England during the past month affords a strong contrast to the case just cited. Although wages in the Fall River mills have, since December, 1899, been at the high water mark of the past ten years, a demand for an advance of 10 per cent. has been granted by the manufacturers without a strike and, in fact, with very little hesitation. The chart at the head of the cotton market report in this issue shows the high point reached in wages at Fall River, as well as their ups and downs for the past twelve years.

During the past month wages in many other New England cotton mills have scored a substantial advance. The increased amount of money thus put in circulation cannot fail to improve business. High wages mean increased purchasing power of the people and consequent prosperity in all branches of trade.

But the contrast between conditions here and abroad is best shown by a comparison of the rates of wages. In Greiz, as we have already stated, the average weekly wages of the weavers amount to but $3.33. According to advance reports of the 1900 census bureau, the average weekly wage in all branches of our textile indus-

tries was $6.07; the wages earned by cotton weavers will average considerably more than this. In Greiz, the workers are toiling 66 hours for $3.33. In Massachusetts, the worker receives more than double that sum for working 58 hours.

We need not go outside of our own country, however, to find contrasts during the month of March. In the Southern cotton mills, where working hours are longer and wages lower than in Fall River, there have been exhibited signs of restlessness on the part of the workers. Strikes have occurred in a few instances, but conditions have been unchanged, and no important concessions have been made to labor in that section. This continuance of former conditions and the advance of wages in Fall River serve to increase the advantage already possessed by Southern mills in respect to the labor cost of cotton goods.

Such differences are due in some degree to natural conditions, and so far must remain permanent features of the cotton industry in the United States. During the past month, from which we have drawn the illustrations already made, a correspondent in the South, a cotton mill operative, wrote us as follows:—

"It seems odd to us here in the sunny South to read of heavy snows in New England at this time. We have not seen any snow here this winter, and probably shall see none. I am sitting at an open window in my shirt sleeves, with the doors of my room wide open."

The cotton mill operatives of one section of our country enveloped in ice and snow with the mercury hovering close to zero. The operatives of another section of the same land, enjoying the pleasures of summer time, clothed in light garments, windows and doors open, birds singing and flowers blossoming.

Here we see contrasts due to natural conditions which are bound to endure and perpetuate the difference in the cost of living in the two sections. This contrast in climate finds its counterpart in the hours of labor and rate of wages in the two sections; in one case, short time and high wages; in the other, long hours and low wages. Such contrasts are made possible in an industry supplying the same market, by the somewhat more efficient organization of the mills where higher wages are paid for less hours of service, by the superior skill of the operatives and by the fact that one hour's work by an operative toiling 58 hours per week is more productive than one hour's work by an operative toiling 66 hours per week.

Turning to England, the leading textile manufacturing country of the world, we find conditions in the cotton mills different from any we have just cited. Her exports of cotton goods are decreasing and, while the price of American cotton has risen, the prices of yarn and cloths show a marked decline. Hostile tariffs and foreign competition menace her foreign market. Her mill owners have operatives to deal with who are better organized than are the workers in any other country on earth. The English manufacturers realize the serious results likely to follow a prolonged strike, such as would surely follow an attempt to reduce wages. Such a struggle between English capital and labor would give the foreign competitor the golden opportunity he is looking for.

These conditions have created a strong sentiment among both mill owners and workers in favor of a general curtailment of production in English cotton spinning mills. Many of the spinners in Royton, Oldham and Hollinwood are running but four days per week. Both mill owners and operatives are alarmed at what they fear is the beginning of a decline that promises to end in placing England in a subordinate rank in cotton manufacturing.

The contrasts we have called attention to carry their own instructive moral. They show clearly how much favored are the textile operatives of this country than are those of other lands, and the more general distribution of material comforts among the people at large.

ENGLISH COTTON MANUFACTURERS TO VISIT US.

We are informed that a delegation of English cotton manufacturers is to visit the United States, to investigate the conditions under which cotton manufacturing is carried on in this country. One of the gentlemen who are to compose the party writes us that they are to come here prepared not only to receive information as to the American industry, but to impart to those they may meet on this side any information in their possession regarding cotton manufacturing in England.

This is a reciprocal arrangement that will commend itself at once to our people. Nature has done much for this country, especially as regards the production of cotton goods, for which she supplies in full measure raw material, power and a favorable climate. Nevertheless, we lack in this industry something that our English friends possess,—the skill and experience obtained only by generations of personal training in the mill.

These envoys from England may study conditions here and learn exactly what they "are up against," but they can by no possibility secure equal natural advantages for their own or any other people outside of America.

On the other hand, the advantages that their manufacturers possess,—skill, experience, knowledge and patience, the slow growth of generations,—can be acquired by us; in fact, are in the course of time sure to be so acquired. One excellent means of hastening this process is by personal contact and a mutual interchange of views.

Thus it is that we have much to gain by extending to these envoys from England every facility in their work. The chairman of the delegation authorizes us to state that they intend to have with them all available statements of the cost of each process as carried on in England, and that this and other information in their possession will be placed at the disposal of individuals and firms in this country. We bespeak for them a warm welcome, not only because they come offering more than they ask for, but as an effective means of promoting good feeling between two great branches of a great race.

The exact time of arrival of the delegation in this country is not yet determined. We shall be advised on this point as soon as it is settled, and if any one desires to be informed in regard to their visit or to meet them, we shall take pleasure in giving our assistance.

THE COTTON GOODS TRADE OF CUBA.

The relations of the United States with Cuba deserves the earnest attention of the American people. It is admitted that the expulsion of Spain from that island has seriously disturbed the economic conditions under which the Cuban people have heretofore lived, deprived them of foreign markets for Cuban products and thus restricted their means of livelihood in that direction, while up to the present time no relief has been offered by the country responsible for the change.

The chief resources of Cuba are sugar and tobacco, and the losses she has sustained in foreign markets can easily be made up to her by facilitating the entry of these two Cuban products into the United States.

Cuba does not ask that this be done on the sole grounds of justice and moral obligation, although these considerations alone are sufficient to de-

cide the question. She is prepared to give a full equivalent. It requires but a brief study of the Cuban import trade to discover what this equivalent is. Of nearly every class of goods brought into Cuba, the United States furnishes a ridiculously small part. Take the trade in textiles as an illustration.

In the seven months ending last July, there were imported into Cuba woolen goods to the value of $280,235, of which the United States supplied less than 1 per cent.

The imports of silk goods were valued at $283,738, of which 7½ per cent. came from the country whose people drove Spain from the island.

Of textile goods made from vegetable fibres other than cotton, the amount brought in was valued at $1,090,240, of which 7 per cent. came from this country.

Of manufactured cottons the Cuban people in the same seven months purchased $3,560,087 worth, of which less than 9 per cent. was supplied from the United States.

Of the total value of Cuba's textile imports, for this seven months, $2,189,686, but 7 8/10 per cent. came from the United States.

Following are detailed statements of the cotton goods imports, showing the amount supplied by the leading countries in this trade, and the class of goods imported:

Imports of cotton goods into Cuba for 7 months ending July, 1901:

COUNTRY OF ORIGIN.	VALUE.	PER CENT.
United States	$310,137	.087
G. Britain	1,939,171	.544
Spain	710,191	.22
France	361,292	.104
Germany	159,806	.045
All other	79,490	.02
	$3,560,087	1.00

Kinds and value of cotton goods imported into Cuba in 7 months ending July, 1901:

CLASS OF GOODS.	VALUE.
Cloths	$683,234
Muslins	1,831,962
Apparel	87,115
Carpets	74
Yarn and Thread	135,284
Quiltings	19,929
Velveteens	48,524
Laces	206,585
Knit Goods	336,963
Waste	17,743
All other	192,683
	$3,560,087

The imports for these seven months were at the rate of $6,120,149 per year. This is by no means insignificant, but the importance of Cuba's trade should be judged not by its present dimensions, but by the vast possibilities of this rich country under an orderly government and with reciprocal trade relations with the United States.

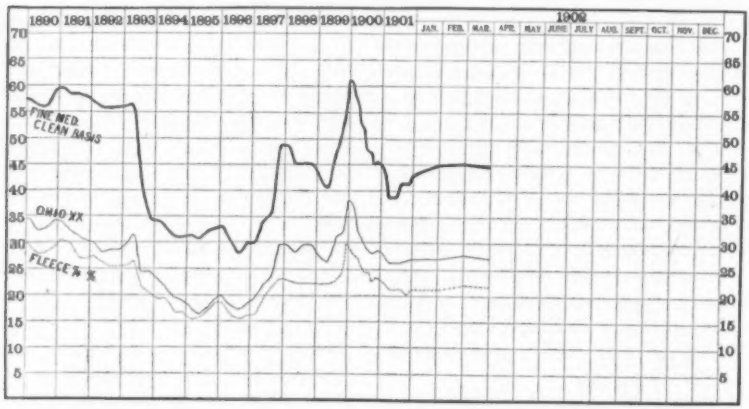
Our relations with Cuba present a unique phase of the reciprocity problem. We are under obligation to grant freer entry of her goods into our country, because we have deprived her of access to the markets of other countries. At this same time the discharge of this obligation will, certainly as far as the textile industry is concerned, result in great advantage to ourselves. If a careful consideration of this question as affecting our people generally should disclose a condition similar to that in the textile industry, then reciprocity with Cuba should be granted without delay.

—The Board of Appraisers have decided that waste bagging of jute, used chiefly as paper stock, but also in large quantities for various other manufacturing purposes, is dutiable at the rate of 10 per cent ad valorem under paragraph 463, tariff act of 1897, as "waste, not specially provided for," and not as bagging for cotton, under paragraph 344, and is not free of duty under paragraph 632 as being "fit only to be converted into paper." A provision for articles "fit only" for a certain use does not include articles which, though chiefly devoted to that use, are employed to a substantial extent for other purposes. The Treasury Department has decided that dyed cotton damask table covers, not in the piece, but separated, fringed, and unfringed, are dutiable at the rate of 45 per

cent. ad valorem under paragraph 322, act of 1897, as "manufactures of cotton not specially provided for."

—The press abroad is much worked up over the prospect of reciprocity in trade between this country and Cuba. The foreign writers admit that such reciprocity means the loss of the Cuban market to the European exporter, a market where he is now supreme. One excited English journalist advises his government to protest against such a breach of faith on our part as Cuban reciprocity would imply. There are many in this country who believe that a failure to give Cuba reciprocity would be the breach of faith.

WOOL MARKET.



A glance at the chart will show that for the last twelve years the price of wool has declined at this time each year except in 1897, when tariff changes created extraordinary conditions. 1902 is evidently to be no exception to the rule. The market is decidedly soft and buyers are scarce.

This is certainly not due to a decreased consumption, since the mills have been busy on a class of goods into which a larger proportion of wool has entered than in any recent year. The explanation of the decline is to be found in the near approach of the new clip and in the natural disinclination of either manufacturers or dealers to encourage an advance at a time when they are negotiating purchases from the growers. A contributing cause of the prevailing dullness is the weavers' strike, which at this writing promises to spread to other mills.

There is certainly nothing in business conditions at home or abroad to depress the price of wool. The foreign wool market is strong and advancing. The demand for woolens and worsted in the domestic market has seldom been better. Manufacturers with very few exceptions have been able to readily dispose of their product. The large production turned out by the mills has resulted in a great reduction of the cost of goods as compared with most years within the memory of the present generation.

Operations in the domestic wool market have for the present time been transferred to the West and the business in the East is confined to odd lots. Until the new clip has passed from the possession of the grower, it is not likely that any change in the direction of higher prices will take place.

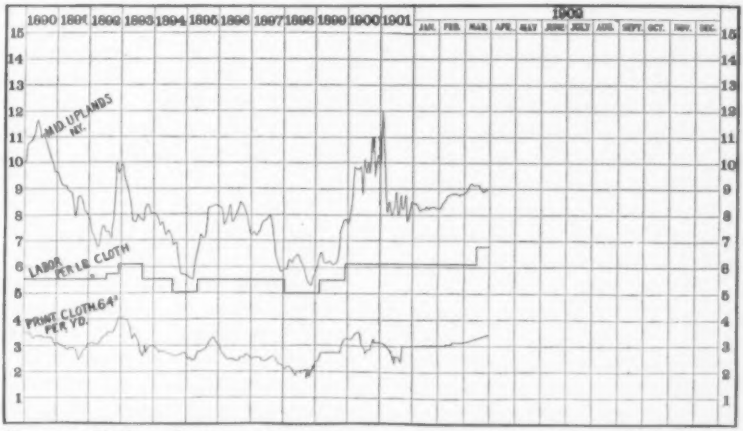
—In the comparison of per capita consumption of wool within and outside of the United States, made in our wool market review in the February issue, no allowance was made for the manufactured goods imported into this country; the estimate of the yearly wool imports was made too low. Taking the imports of wool (125,000,000 lbs. in the grease) and woolens (value $15,600,000) for 1901 as a basis, the revised estimate of per capita production of consumption of wool will be as follows:

Production and Consumption of Wool per Capita (Scoured Weight.)

	Production.	Consumption.
United States	25 9-10 ozs.	52 2-10 ozs.
Rest of world, outside of Tropics	18 4-10 ozs.	16 1-2 ozs.

This estimate indicates a per capita consumption of wool in the United States 216 per cent. greater than in the rest of the world, and makes the illustration of the better conditions here, still stronger.

COTTON MARKET.


1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901
1902
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
MID. UPLANDS N.Y.
LABOR PER LB. CLOTH
PRINT CLOTH 64" PER YD.

Two conflicting factors have operated in the cotton market during the past month. On this side of the water, the advance in wages of mill operatives and the activity in the cotton goods market served to strengthen prices for the staple. Abroad the curtailment of production on the part of English spinners, and the rather unsatisfactory state of trade on the Continent had an immediate effect in putting prices for the raw material down. In spite of our undoubted importance as a cotton manufacturing country, we are not yet "the whole thing." We are near it as regards cotton growing, but as consumers, we must still defer to the countries of Europe.

The receipts of cotton have continued unusually large and given rise to the belief that the present season's crop is larger than any estimates have given it credit for. This has proved another depressing factor. Then again next season's crop is now to be reckoned with. The high prices for cotton that have been in evidence so long has resulted in the planting of an increased acreage. None know this so well as the planters themselves, and to this fact is ascribed the large movement of cotton to the seaboard, shippers desiring to be rid of old cotton before the avalanche of a bumper crop is ready to be moved in turn. The Chronicle estimates the visible stock on March 28th, this year at 4,233,233 bales; as compared with 4,008,465 bales for same date last year; 3,477,723 bales for 1900; and 5,201,715 bales for 1899.

The market for Egyptian has been strong and has not been affected in sympathy with the weakness of the general market following the rise indicated on our chart.

Foreign Samples of Woolens and Worsteds.

We are advised by the publishers of Le Moniteur des Echantillous de l' Industrie drapiere, that in future 400 samples will be furnished per season of six months instead of 308 samples as heretofore.

Complete weaving directions for 368 of the 400 samples will be given, including size of yarn, threads in warp, picks in filling, width in the loom and pattern and chain drafts.

The subscription price remains the same, $11.00 per season of six months. The journal is issued every two weeks and thus supplies manufacturers with a means of keeping in close touch with the changes in European styles.

The Textile World has the agency for this sample journal, and supplies subscribers with a key by which the German terms employed can be readily understood by English readers.

New England Cotton Manufacturers' Association.

The annual meeting of this Association to be held in Chipman Hall, Tremont Temple, Boston, April 23 and 24, 1902, promises to be of unusual interest.

His Honor, P. A. Collins, Mayor of Boston, will welcome the members at the first session. Every one of the following subjects on which papers are to be read is of direct interest to all engaged in the manufacture of cotton goods:—

Brick Factory Chimneys, Some Features of their Construction; Methods of Cotton Textile Instruction; Supervision of Mills; Bleaching; Working of Egyptian Cotton; Friction Due to Spindle Bands; Thread Boards and Guides for Wet Spinning; Japanese Cotton Mills; Flyers; The Abuse of Oils in Cotton Mills; Combing Cotton; Weighting of Top Rolls; Viscose; Hydraulic Compressions of Air; Knots and Knot Tying; Electric Driven Cotton Mills; A New Method of Incandescent Lighting; Metallic Thread Boards for Spinning Frames.

The Board of Government desire that these topics be fully discussed at the meeting and urge those members who cannot attend to send in written comments upon any of the papers, copies of which will be furnished five days in advance. A general acceptance of this invitation will do much to increase the value and interest of the meeting.

Free telephone service is to be furnished to the members during the days that the meeting is held. The plaster cast for the bronze memorial tablet to be erected to Eli Whitney at Rocy Creek, Georgia, will be on exhibition at the meeting.

An account of the proceedings will appear in the next issue of the Textile World.

Textile Schools and Mill Work.

The channels of trade and manufacturing in the thickly populated countries of Europe are of a more permanent character than with us. This is seen in the textile industry where the business is handed down from father to son and continues in the same family for many generations. Under such conditions the opportunities for the individual without family connections to become a mill owner or manager are greatly reduced. This explains the large proportion of students in the German textile schools who are sons or other relatives of mill owners. Such students are practically assured of a good opportunity in their vocation when they complete the course of study. The private weaving school at Aachen, Germany, offers to students who have completed the regular course an opportunity to experiment at the school in the manufacture of such goods as are made in the mill they expect to enter. Such a supplementary course of instruction in the special branch in which the student is to engage is calculated to greatly increase the practical value of the

school. While the idea is of course better adapted to European conditions, it may offer a suggestion to our own textile schools by which they may be able to bring the student in closer touch with the practical work of the mill.

Conquests of Chemistry.

Possibly other methods may be found of manufacturing artificial indigo; nevertheless, the time has come when the natural product meets the artificial product in a life and death struggle, similar to that which took place between alizarine and madder.

The producers of natural indigo throughout the world feel the competition of the artificial product. This is shown in the diminished exports of indigo from the four Indian ports, Calcutta, Bombay, Madras and Karachi, which for the last five years were as follows:

1895-6	187,337 cwts.
1896-7	169,523 cwts.
1897-8	133,849 cwts.
1898-9	135,187 cwts.
1899-1900	111,420 cwts.

The Indian Government reports that in 1901 the area devoted to raising indigo was 39 per cent. less than for the previous year and over 50 per cent. less than five years ago. A portion of the land formerly used for raising indigo is now turned to the raising of sugar cane. The Indian Government has appropriated $16,000 yearly for three years, to be devoted to extensive experiments designed to improve the methods of indigo culture.

For Germany, the enormous profit resulting from this economic change is unquestioned; in 1896, Germany imported indigo to the value of $4,760,000, and exported none; two years later, in 1898, Germany imported natural indigo to the amount of but $1,973,020, and the exports had reached the sum of $1,802,612, so that the German foreign trade in indigo left practically no balance to be settled with cash. Since the last named year, the balance have become even more favorable. For the first six months of 1901, the German exports of artificial indigo amounted to $2,113,051 lbs.; the imports of natural indigo during the same time amounted to 972,405 lbs. Thus we see what great changes are effected in the economic conditions in other lands by chemical investigations and discoveries.

Thirty years ago the madder industry in the south of France was destroyed, and now the indigo industry in the far East meets the same fate, both the result of the work of German scientists. Perhaps the time may come when chemical synthesis will celebrate its triumph over the great food products, a result that will be a blessing to all mankind, although not of particular advantage to the agrarian industry, which will then have an experience similar to that of the woad cultivators in Thurigen, the madder growers in South France, and now the indigo producers in India; the persistent claims of our political economists that the agrarian industry is of the greatest importance, although perhaps not essential to the state, will be considered in the light of a competition between artificial and natural food products. A far seeing statesman will then care not alone for the agrarian industry, but also for the broad economical welfare of the state. Then we will rest on the heights and not be tributary to foreign lands for our necessaries of life, an experience that will be somewhat similar to that of France, whose government at one time prescribed the madder dyes for military cloth, in order to have a regular market for the French producer of madder; now France purchases millions of pounds of German alizarine, which has driven out the madder dyes.—Dr. Escales, in Bavarian Industrie and Gewerbeblatt.

—Detraction is still the greatest burden on society.—A. Daudet.

The Tuskegee Cotton Expedition to Africa.

BY J. N. CALLOWAY, A MEMBER OF THE PARTY.

In the fall of 1900, the writer and three of the graduates of the Tuskegee Industrial Institute, at Tuskegee, Alabama, were hired by the German Colonial Economic Society to go to the German colony of Togo, in West Africa, to teach cotton culture to the natives there. Cotton has been raised for centuries, in a small way in that part of Africa. This society, which is composed of two thousand of the leading titled personages and most prominent men of the German empire, organized to promote the development of the German colonies, proposes to see if cotton raising cannot be made larger and more profitable in that region. For several years I had had charge of the Marshall Farm, as the Tuskegee Institute seven-hundred-acre plantation is called. Two of our party were graduates of the Institute's agricultural department, and the other was a graduate of the mechanical department. We took with us a gin, one hundred and fifty bushels of cotton seed, agricultural tools, and various other materials such as we might need.

We sailed from New York for Hamburg, and there transferred to a coasting steamer bound down the west coast of Africa. It is significant of the trade in that part of the world that, in addition to a large quantity of gin,—not cotton gin either,—we had on board a considerable amount of powder and a number of cases of matches. The powder was stored below deck and the matches on deck. In the course of a storm which shook us up badly some of the matches were ignited, and we were more than uncomfortable until the fire was put out.

BEGINNING NUMBERING AT THE LEFT.

1. King's Guard. 2. King's Adviser. 3. King's Interpreter. 4. King. 5. J. W. Robinson, one of the Tuskegee Students. 6. Lieutenant Smend, German Station Master. 7. Governor Horn, the German Governor of the Colony. 8. The German Governor's native Interpreter. 9. J. N. Calloway, the Superintendent of the Tuskegee Party. 10 Allen Burks, one of the Tuskegee Men.

Togo is a colony about the size of the State of North Carolina. It is situated on the north coast of the Gulf of Guinea. The sea port is Lome, and there we landed. Lome is

a neat German town, with broad, well kept streets. A location for our plantation was selected near Misahohe, a station sixty miles inland, where, on account of water and the intersection of roads, the conditions were favorable for our work.

There are good roads throughout much of the colony, built by natives hired and directed by German officials. We could have driven in a buggy from Lome to our plantation, if there had been any buggy or anything to draw it. So far neither horses, cattle nor mules have withstood the bite of the tzetze fly in the colony. We had forty-two head of oxen and horses sent out for our use, and all of them died. This fly is small, and not much unlike the ordinary horse-fly in appearance. His bite does not effect sheep, and excellent mutton is raised in the colony. Neither does the bite seem to be injurious to human beings, unless it may be that, as is said to be the case with mosquitoes, it carries the malaria with which the climate abounds. There are so many mosquitoes there, though, that there is no proof of this.

I wanted to get some specimens of the fly, and offered a copper for every specimen brought me. A copper is equivalent to a cent and a quarter of American money. In a very short time the natives had brought me sixty specimens, and so many more men were reported to be getting ready to engage in this for them fabulously remunerative occupation that I hastened to withdraw my offer. Several men were bitten by the flies either in catching them or bringing them to me, but no unpleasant results followed. With its accustomed thorough attention to essential details the German government has skilled scientific men at work in the colony studying the fly and the effects of its bite, to see if it is not possible by inoculation or some kind of treatment to counteract its effects.

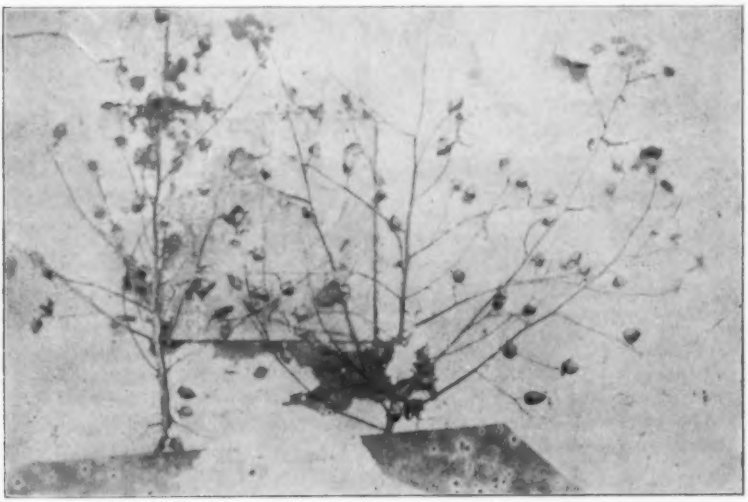
AMERICAN COTTON GIN AND WAGONS AMONG AFRICAN PALM TREES.

All carriage of goods is, therefore, on the heads of the natives. We secured a gang of men to take our stuff into the interior at the regular price, which is five shillings for the trip, each man carrying sixty pounds. We had taken out with us two lumber wagons, one of them made by stu-

dents in the carriage shop at the Tuskegee Institute. We planned to put our things into these wagons and have the natives draw them, but they refused to do this. They had never seen such vehicles, and were afraid they would get away and run over them. They very kindly offered to carry the wagons in on their heads, but the matter was finally compromised by our leaving the wagons until the horses came out later. The natives took everything else. The trip occupies two days. Three of our party walked. I was carried in a hammock slung to a pole fastened to two boards, which rested on the heads of four men.

At first we hired one hundred acres of ground, but eventually we purchased this, with four hundred more acres. The price paid was about $150 for the whole lot, but this was considered high. A native missionary, trained in some of the European missionary stations which have existed for years in the country, and who had a station near us, occupied about one hundred and fifty acres which he had bought for $7. There seems to be a pretty definite ownership of land by the natives, although there are no written records except as the German officials now draw up papers for land transferred. The Germans have occupied this colony since 1884.

Word having been sent out by the German governor of the station that I wished to interview the chiefs about hiring men, a day or two after our arrival some thirty or more chiefs and headmen assembled and squatted down in a semi-circle, while I told them with the help of an interpreter what was wanted. As a result we soon had help enough to begin work.



SAMPLE STALKS OF TOGO COTTON SHOWING THE NUMBER OF BOLLS.

A hundred acres of ground were selected. This, like nearly all the land there, was covered with a stout grass in many places twenty feet high, not unlike what is called a "cane brake" in the southern states. First this grass was cut down. Then men with stout spades dug up the ground. Women and children shook the dirt out of the roots and piled the roots up to be burned.

In addition to the seed we had carried out from America, we had a quantity of Egyptian seed, which had originally come from Alexandria and which had been sent to us from Hamburg. We planted both these kinds,

and also planted the native seed. We began planting in April. As the horses and oxen all died, it was necessary to use native labor for everything. The cotton was furrowed out with plows drawn by natives, four men to a plow. The price for native labor ranged from ten to twenty cents a day, and the men boarded themselves.

Misahohe is about six degrees north of the equator. The winter months are about like an Indian summer in the southern states—clear, dry weather. June, July, August and September are like a very wet summer in the South.

As a result, the American cotton that we had planted in April, maturing in about four months, ripened in August, right in the middle of the rainy season. Any one who knows anything about cotton will understand how unfavorable this would be for securing a good crop. On the other hand, seed of the same kind planted in August ripened in December, when the weather was dry, much more favorably.

The American seed produced plants five feet high on an average, and on the best developed plants there were from fifty to sixty bolls to a plant. This is, I think, equal to the best yields in this country. The Egyptian seed was about a month longer coming to maturity, and did not yield nearly as well.

The native variety gave a good growth and a good yield after the rainy season was over. Evidently the result of long adaptation to climate was to be seen in the development of this native plant. If planted in April, along with the American seed, although the seed germinated as quickly and the plant began to grow, it did not put out its cotton until the rainy season was over, and, eight months after it was planted, was harvested with American cotton planted in August. On the other hand native cotton planted in August matured in December, along with the same cotton planted in April.

The staple of the native plant is rather wooly. It is about the same color as the American cotton, and is quite unlike the yellow color of the Egyptian staple. The following dis-

THE FIRST BALES OF AMERICAN COTTON RAISED IN TOGO BY THE TUSKEGEE PARTY.

patch from Berlin, gives the results of grading Togo cotton on the Bremen exchange:

Berlin, March 13.—The negroes of the Tuskegee Normal and Industrial Institute who were engaged the latter part of 1900 by the German government to teach the natives of Togoland, German West Africa, how to grow cotton, have, according to the report of the colonial committee, succeeded in producing cotton which is graded on the Bremen exchange above American middling.

The Tuskegee negroes have demonstrated that the land in Togoland is suitable for cotton, of which there is great abundance. The only obstacle to the commercial utilization of this product is transportation and especially getting the bales to the coast. The colonial committee has sent an expedition of engineers to survey for a railroad from the coast town of Lome to Palime, in the interior.

Our gin was originally rigged with one sweep, to be used for horse power, but after our stock died, the young man who had set up the gin and rigged the machinery, attached four sweeps instead of one, and six natives were set to work at each sweep. The twenty-four men furnished all the power necessary.

As to the ultimate future of the experiment it is yet too early to speak definitely. That the society feel encouraged, though, may be inferred from the fact that when I return to Africa the last of March, 1902, after a six weeks' visit at home, I am to take back with me several more young men from Tuskegee who know something about the culture of cotton and who have been hired to locate among the natives as model farmers.

The natives seem interested in our improved methods of cultivation, and I think they will be disposed to profit by them in their own work. I am inclined to believe from what I have seen of the country so far, that it is doubtful if white men will be able to live there as planters. They are much more susceptible to the so-called "black water" fever, of which at least half the cases prove fatal with them. The black men take this fever rarely, and then are much more likely to recover.

The German officials in the colony stay there only two years, and then go home for six months recuperation. The German officials with whom I came in contact were uniformly courteous and helpful. They were well posted with regard to affairs in this country, and American news reached us regularly through the medium of the German papers.

The natives are good natured and easy to get along with as a general thing. I think they are quite as willing to work as could be expected when one considers that they have not been used to steady employment and that the climate and resources of the country render very little effort necessary to make a living. The natives live in small villages. Most of them have little farms in the bush, often at a considerable distance from their homes. The women and children do the most of the work upon these farms. A man may also have a patch of ground that he cultivates himself, but he is likely to leave this to his wives' care at any time for a trip to the coast as a carrier.

The native crops are cotton, yams, plantains and sometimes cassava. The cotton and yams are planted together. The yams are not unlike a big white potato. They are boiled and the substance beaten into a paste much like bread dough. This, eaten with soup, forms almost the whole food of the natives.

The native houses are mud huts often not more than six by eight feet square. A mat to sleep on and a few pots will comprise the whole of the household furniture.

We had a five-room mud house built for us. To build such a house poles are set up in the ground and palm branches woven back and forth among the poles. Mud is then plastered on until the walls are thick enough. The roof is of grass, this being cheaper and cooler than iron or wood. In spite of the tremendous rains of the summer season, these grass roofs keep the house dry, and they do not need to be replaced oftener than once in two years.

We slept on low beds made by

stretching canvas over posts driven into the ground. We had a cook to whom we paid five dollars a month, and a wash-man who received two and a half dollars per month. The latter, however, had the privilege of working for others.

Americans and Europeans can have almost any food they wish to pay for. There was a town of about a thousand inhabitants one hour's journey from where we lived. We could get almost anything there. If I wanted some clothes I would send my "boy" to town with a message to the tailor. By noon the tailor would be at our place to take my measure, and in a few days the clothes would be ready for me. Europeans and Americans wear the thinnest possible underclothes, and thin white or khaki cloth outer clothing. The tailor was a native whose trade had been originally taught him by the missionaries; this missionary work of teaching was begun so long ago that the natives now learn trades from each other. In this town of a thousand inhabitants there were only two white men, both of them German traders.

We got our flour from Minnesota, ham from Chicago, butter from Denmark, and canned fruit from California. Of course the prices were high for goods carried so far. Ham was forty cents a pound. The native fruits are abundant and good, but all of a tropical nature. The wild pineapples were uncommonly large and good. Oranges were small, not so sweet as in this country and with more seeds, due, I suppose, to lack of cultivation.

There is a great deal of malaria, and every one, natives included, is likely to suffer from attacks of malarial fever. Frequent taking of quinine, though, seems to ward off any serious effects. When the natives are sick they steep and take what they call "bush medicine." I have thought that perhaps an investigation of these native remedies might result in a discovery of valuable medicines, but I did not feel just like trying any of them myself.

Afridi Wax-Cloth.

The Government of India has succeeded in inducing the Afridi wax-cloth workers to reveal the secret of their craft, which has hitherto puzzled all inquirers into India industries.

Afridi wax-cloth, a kind of raised colored painting on cotton fabrics, has been made almost from time immemorial, and is a well-known product of certain workshops in Peshawar, Lahore, Calcutta, and Bombay; but until recently complete ignorance prevailed, outside the circle of artisans, as to the method employed.

It appears that the medium, known as roghan, is a peculiar product of the safflower seed. The method of preparation, which is carried on entirely at Peshawar, is to boil the oil—expressed from the seeds by cold pressure—for twelve hours, and then throw the heated fluid into shallow pans of cold water. Under this treatment it swells up into a thick jelly-like substance, which is the roghan, of commerce.

Before being applied to the cloth it is mixed with some mineral color and drawn out into fine threads on a pointed style, with which the pattern is traced. The operators, who are invariably Afridis, attain a very high degree of skill, and possess marked artistic abilities. The weight of Afridi wax-cloth—an Afridi woman's costume would turn the scale at over thirteen pounds—makes it unsuitable for European dress; but the ever increasing demand for household drapings gave a ready outlet for the Afridi artisan's skill, to which he has already adapted himself. Careful tests made in Calcutta also showed that as a waterproofing material, or as a material to be used in the manufacture of linoleum, roghan has a distinct claim to consideration, and is in some respects

superior to linseed. Systematically exploited, there would appear to be a promising future before this industry.—The Times of India.

Improved Bagging Machine.

C. S. Dodge, Lowell, Mass., is placing on the market a bagging machine that has been in use for several years in some of our best mills, among which may be mentioned the Washington Mills, Lawrence, Mass., and the Goodall Worsted Co., Sanford, Me.

The advantage of this machine as compared with the method of bagging by hands and feet is apparent from the statement that one man with the machine can bag and sew 60 sacks in 10 hours and put more stock in each bag than by the old method. The stock is not rolled as it is apt to be by the hand method, but is left open and lofty as it comes from the drier or other machines.

This bagging machine is especially adapted for wool, shoddy, noils and yarn waste. Four of the machines are in use by W. H. H. Slack & Bro., Springfield, Vt., and all are giving good satisfaction. Mr. Dodge is very busy at present building these bagging machines and shoddy pickers. He has superior facilities for repairing shoddy cylinders and making hot forged picker pins.

Cost of Flax Production.

As is well known, the best flax in the world is that retted in the waters of the River Lys, and called Courtrai flax, from the name of the Belgian canton where the seat of the industry is found.

This high grade flax industry is on the decline, and this is attributed to various causes. A writer in l'Industrie Textile states that the principal of these is the improvement in methods of spinning by which a much better linen yarn is obtained from the inferior grades of flax than has heretofore been possible.

The lower cost of cotton has resulted in fabrics from this material displacing linen to a considerable extent. It has also been found that cotton thread is better suited for sewing thread than is linen, and as a consequence the flax industry has not been stimulated by this wide distribution of sewing machines. The same writer gives the following figures on the cost of preparing retted flax for the linen mill, which were obtained from a plant in operation on the River Lys, in France:

Cost of Plant.

Buildings and motor	122,500 fr.
2 breakers	2,000 fr.
50 mills	10,000 fr.
Tools, etc.	5,000 fr.
Interest and depreciation per 2200 lbs. retted flax	9 fr.

The yield of prepared flax is about 20 per cent. of the weight of the straw. The labor cost for 2,200 pounds of straw is as follows:

Breaking; 2 men, 50 cents per day	$1.00
4 boys, 25 cents per day	1.00
Strippers; 5 hands, 78 cents per day	3.90
	$5.90

Upon the above figures, the following estimate of cost of 2,200 pounds prepared flax is based:

11,000 lbs. straw, $2.30 per hundred	$253.00
Labor	29.50
Interest and depreciation	9.00
	$291.50
Deduct value of waste	22.80
Net cost 2200 lbs. prepared flax	$268.70

This is equal to 12 2/10 cents per pound.

—The textile manufacturers of Renaix, Belgium, to the number of 19, operating 1622 looms, are reported to have formed an association for the purpose of regulating the wages of their employees. Each member is taxed 80 cents per loom per year for a general fund, and is at liberty to adopt the association schedule of wages or not, as he prefers. If a strike occurs in a mill in which the association wage schedule is in force, the owner can order a lock-out of the help in all the other mills bound by the contract, under penalty of a fine.

New Machinery and Processes

This department is designed to present from month to month a brief mention of new machinery, devices, and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market.

Interested parties are referred to the manufacturers for further information. These items are published without charge and regardless of advertising consideration, the idea being to present to our readers a systematic monthly record of new machinery, etc. of interest to textile mill men.

We invite machine builders and others to send us such information for this department.

Knot Tyer for Woolen and Worsted. Barber and Colman, 11 Pemberton Square, Boston, the builders of the well known Barber Knotter, which has revolutioned knot tying in our cotton mills, have adapted this machine for woolen and worsted yarn. Some of the leading worsted mills are using it and with the same advantage over hand tying that has been experienced by cotton manufacturers.

Cotton Comber. Stephen C. Lowe, 186 Devonshire Street, is offering to the trade the Nasmith cotton comber built by John Hetherington & Sons. This machine is constructed upon new principles which increase production and maintain quality of the work. A detailed description will be found in the Cotton Department of this issue. The machine can be seen in operation at Mr. Lowe's place of business in Boston.

Overedge Sewing Machine. The Arnold Sewing Machine Co., Newark, N. J., are introducing an improved overedge sewing machine, which has already been adopted by some of the largest knit goods manufacturers in the country. A description appears in the Knitting Department of this issue.

Hand Loom for Schools. Mrs. M. P. Todd, 713 East 18th Street, Minneapolis, Minn., has invented and is putting on the market a hand loom for use in schools for teaching the first principles of weaving. It is 9 by 12 inches, made entirely of wood with the exception of the side rod, and is adjustable to different widths of work; the length can also be adjusted.

Ferrofix for Brazing Metals. The American Ferrofix Company, 20 Broad Street, New York, are introducing into this country a process for brazing wrought iron, steel, copper, bronze or any other metal harder than brass. An article describing the process will be found in another part of this issue.

Twist Tester. James Heal, Old Cock Yard, Halifax, England, has recently put on the market an improved twist testing machine, which contains many improvements and is constructed with great care, in order to enable the twist in yarn to be quickly and accurately determined. A sheet of black metal forms a background for assistance in examining the yarn, and this ground can be changed to white when colored yarn is being tested. The chief feature of this machine is the sliding double acromatic lens which is used in testing single yarns, especially those of fine counts.

Electric Jacquard Card Stamping Machine. The Zerkowitz Company, Borough Mills, Bradford, England, have ready for the market an electric jacquard card punching machine, invented by Zerkowitz, and which promises to revolutionize the present tedious methods of cutting cards for jacquard designs. The machine is too complicated for us to even lightly touch upon its leading features here. Reports state that it is giving good satisfaction where used.

Machine for Opening Out and Folding Cloth. Elkanah Hoyle & Sons, Waterside Works, Halifax, England, are placing on the market a ma-

chine for opening out and folding cloth, that is in the rope form as it comes from the washers, fulling mills, etc. It is of simple construction, and is designed for the use of small manufacturers who cannot afford the more expensive machines used for this work. It is said to be a great improvement over the hand method, saving the labor of one man. With the exception of the spindles of the four rollers, the whole machine is made of wood, and from the description given, we judge that it can be built by any mill carpenter.

Revolving Box Loom. W. B. White & Sons, Red Scar Spring Works, Colne, England, are putting on the market a revolving box loom possessing some new features. It is said that this loom will check goods with seven or eight shuttles, and is fitted with two tread inside and three, four, five, and six tread outside. It can be run at 190 picks per minute. The repeating device is a special patent motion. By placing 100 cards on the inside cylinder and twenty on the outside, 2000 picks can be obtained for 120 cards.

Winding Machine. Joseph Stubbs, Ancoats, Manchester, England, is placing on the market an improved winding frame with a patent tapering motion for forming the cones upon single flanged openings.

Bleaching Machine. Emil Welter, Mulhausen, Germany, is introducing a new bleaching machine for cloth in open widths. The goods are hung in long folds from rods, which are actuated by endless chains. Before entering the chamber they are subjected to a soda lye. At the exit, the goods are passed through water, after having been steamed in the chamber. It is said, that one machine will handle 30,000 yards of cloth per day, and that each portion of cloth is subjected to the treatment for half-an-hour. Folding the cloth in the open prevents stains and streaks. After passing through this chamber, the cloths are colored, soured and washed in the usual manner.

Fibre Treating Machines. E. Lehmann, Manchester, England, has recently perfected two machines for treating such vegetable fibres as aloe leaves, henequen fibre, sisal hemp, Manila hemp, rhea, etc., preparatory for the manufacture of rope, coarse fabrics, matting, etc. One is a stationary machine for permanent location in mills; the other is mounted on wheels to permit of transportation from one part of the field to the other.

Worsted Spinning Frame. J. & T. Boyd, Glasgow, Scotland, have recently placed on the market an improved spinning frame for worsted, built on both the cop and flyer principle, which, although not embodying any new principle, differs in certain details of construction from other makes of these machines. Among the advantages claimed are increased weight to prevent vibration, and a tension band by which the tension on the different spindles does not vary over 10 per cent. Another feature is the device for regulating the pressure on the top front rollers. This consists of a combination of springs and levers. By turning a hand-wheel the tension on the springs can be closely regulated. At night the pressure can be removed, to be put on again in the morning by a few turns of the hand-wheel. The pressure is said to be the same on each roll regardless of size.

Hawking Machine. Walter Turner, Wheatley, Halifax, Eng., is placing on the market a hawking machine for indo vats. The piece is stripped automatically from the rollers and folded at the bottom of the vat. It is claimed that the cloth is secured from damage and laid more uniformly in the vat than is possible by present

methods. But one attendant is required.

Builder for Flax Spinning. The Automatic Roll Stop Co., Dundee, Scotland, have brought out a builder for flax spinning machines, which is said to be much superior to devices at present in use. The new builder supersedes the present plan of having the spinners drag the bobbins by means of weighted cords, which is the most laborious part of the work of spinning. By the clearing away of unsightly mechanical obstacles, the heavy items of cost for temper cords, wear and tear of several important parts of the frame, and the wearing of bobbins are saved, and free access is obtained for the proper oiling of spindles, their adjustment, cleaning, etc.

Roving Frame. Brooks & Doxey, Union Ironworks, West Gorton, Manchester, England, are placing on the market an improved roving frame, which, while built on the general principles of their old machine, is modeled to secure certain improvements. The roller stands are provided with an adjustable bracket carrying an iron clearer cover. This is designed so that when the clearer is turned up it does not come in contact with the roving. Pilling's patented system of roller gearing is used, and the makers claim that there is no possibility of any of the wheels getting out of gear. A differential motion of special design is used.

Combination Shearing, Singeing, Brushing and Cleaning Machine. Friedrich Haas, Lennep, Germany, is building a finishing machine to shear, singe and brush cloth in one operation. It is provided with fans to remove the dust and flocks. Among the advantages claimed are reduced cost for labor, clear atmosphere in workrooms, the removal of bunches and slugs from the cloth and less wear on the machine owing to the absence of dust. It is recommended for cotton, linen, jute, half wool and all wool fabrics.

Bale Breaker and Mixer. The Sliver Bale Unwinding & Blending Co., Manchester, England, are introducing a machine for unbaling and blending cotton from the "Lowry" bale. With it, as many as 10 bales can be opened and blended uniformly at the same time. The bales are placed side by side on revolving plates, and on either side of a traveling lattice, which carries the cotton to the feeder.

Guard for Mule Carriage Wheel. John Hetherington & Sons, Manchester, England, are applying to their mules an improved guard for carriage wheels. It is a sort of skate, which is not attached to the wheel or carriage, but surrounds the lower part of the carriage wheel and slides along with it on the rail. It is claimed that there is very little friction in the movement of this guard.

Woolen Card. G. Josephy, Bielitz, Germany, is putting on the market a woolen card with a new arrangement of finisher doffers by which it is claimed that fine numbers can be produced with two doffers without the variations that have heretofore accompanied the use of two doffers on fine counts. The doffers are connected with intermediate rollers, which can be thrown out of action if desired, making the machine a one or two-doffer card.

Fulling Mill. Wm. Schiffers, Aachen, Germany, has recently brought out a rotary fulling mill having several novel features. The pressure of the two upper rolls on the lower roll is obtained by adjustable weights and levers. One of the upper rolls is driven from the main shaft by a combination chain and gear. The other roller is driven by friction with the lower roll. The pressure of this loose roll is automatically regulated to prevent slipping on the cloth. Both the top and sides of the crimping box are adjustable.

Brazing Metal Work.

The new material for brazing, called Ferrofix, under the influence of heat, decarbonizes the surface of cast iron and practically converts the iron into steel. Then the brass spelter runs into the joint, amalgamates with the cast iron and forms a solid metallic body, which is claimed to be stronger than the rest of the casting. This process has been in use in Europe for two years and today is used hourly by such concerns as the following: Krupp Gun Works, Essen; Gans & Co., Budapest; The General Electric Co., Berlin; The Singer Sewing Machine Co., and many others.

The advantages of a simple and sure method of brazing broken castings in mill work will need no demonstration. The difficulties of brazing by ordinary means are so great and the results so uncertain that the process is not used to any extent in mill repair work. If the teeth of a gear break, a new gear is substituted or pins are inserted in the rim, the last named method generally causing breakdowns far more serious than the original one, by the pins becoming loose and displaced. Then there are breaks in castings of foreign make which cannot be quickly replaced; here an efficient method of repairing will often save very large sums of money, out of all proportion to cost of repairs or castings.

The American Ferrofix Co., 20 Broad Street, New York, offer to the trade the two compounds, Ferrofix and Borfix (the latter a substitute for borax), with the claim that they afford a quick and certain means of joining cast iron to cast iron, wrought iron, steel, red copper or brass. This claim is backed up by references to many of the leading metal workers of the world who are using the process, and also by their offer to give a practical demonstration of the process at their works, 74 Hudson Street, Jersey City, which have been equipped specially for repair and brazing work.

The simplicity of the process adapts it for use in the mill repair shop. The Ferrofix powder and brazing fluid, mixed to the consistency of cream, is applied to the surfaces to be joined. The parts, held together by a wire, are then heated, after which a mixture of Borfix and brass spelter is applied. The parts are then returned to the fire. The spelter runs into the joint, the chemical action uniting the metals takes place, and upon allowing the casting to cool slowly, it will be found stronger at the joint than in the other parts. The following letter from a user of the process speaks for itself:

H. A. Ward, Esq.,
Jersey City, N. J., July 31, 1901.
American Ferrofix Co.,
New York City.

Dear Sir: Kindly advise us when we can have a further supply of ferrofix and hasten delivery all possible, as our success in brazing castings has been so gratifying that we purpose to repair some old machines which have been unused for some time, as the cost of new castings was too great. Yours very respectfully,

AMERICAN CIGAR COMPANY, by H. M. Magie, Chief Engineer.

Further information concerning this process can be obtained from the American Ferrofix Company, 20 Broad Street, New York.

—The Board of General Appraisers have decided that strips of cotton cloth, about 2¾ inches in width, without hem or selvage, and having an ornamental design in red running lengthwise in the fabric in three parallel lines printed thereupon and used as ornamental attachments to night garments, are not dutiable as countable cotton cloth under the provisions of the cotton schedule, but are properly dutiable as "trimmings," at the rate of 60 per cent. ad valorem.

—The Oest Wollen und Lein. Ind., states that the unwinding of the spiral cotton bales of this season's crop is giving less trouble to foreign spinners than in any previous year, owing to an improvement in the process of baling by which the hard edges and soft centres are avoided.

Evolution of the Angora Goat.

BY A. S. HEATH, M. D.

Wild goats are divided into two sub-genera, ibexes and goats proper. What is usually termed the Rocky Mountain goat of North America is a misnomer, as it is a sheep. There is, however, a Rocky Mountain goat. It is rare. Lydekker states that the goat is of an older geological epoch than the sheep. Becoming isolated, both wild and tame animals gradually develop into distinct species in the course of ages.

It is probable that the several species of goats were evolved in the manner referred to from remote ancestral stock. Time works strange marvels.

The two wild species that have been claimed by writers as the progenitors of the Angora are given in photographs, leaving the discussion of the subject as to which species belongs the honor of the parentage of the modern Angora to those who enjoy speculative investigations. The beard of one species extends from the chin to the shoulders and chest, and whose long spirally-twisted horns have the twist outward from the base. The ewes have a beard confined to the chin only, the horns also have a slight spiral twist in the same direction as the males, though less marked.

This species is a native of the western Himalayas, Northern Afghanistan, possibly also of Persia. It is generally found in Cashmere and on the Thibetan side of the Himalayas according to Brehm. Its habitat favors the claim that it is the Angora.

A second species has horns very large and strong, and relatively longer than any of the ruminants. The horns of this species are somewhat triangular in form, and transversely corrugated, bent backward like those of the domestic goats, scimiter-like. This species is far above the height of the domestic goat. The fur, or hair, covers the greater part of the body, and is short and of a grayish color. There is a black line running along the centre of the back. The beard is of a brownish color in both sexes.

The Angora derives its name from Angora, a town of Asia Minor. The modern Angora yields a valuable, soft, silky, silvery, lustrous, white hair, in twisted ringlets, known as mohair. This hair is used for fabrics, either alone, or mixed with wool, silk, cotton or linen, for ladies or children's wear. These, in part, at least, make brilliants, linings, braid, plushes, astrachan cloth, furniture coverings, curtain material, knit goods, dress goods, and an infinite variety of fabrics. The pelts of the Angora, tanned with the hair on, are used as mufflers, trimmings for ladies' and children's clothing, for mats, rugs, robes or overcoats dyed in any colors.

The meat resembles venison, over which it has the advantage of prime condition, and can be supplied the year round, there being nothing to limit its use as to period or time. Fig. 2 shows a sample piece of mohair dress goods.

As the Angoras are now crossed on the common goat for several generations, the increased infusion of blood produces a mohair of great value, and as breeding of today is infinitely superior to the haphazard methods of the Turks, the mohair produced in the United States is equal or better than some of the mohair raised in Turkey.

The sheep tribe of domestic animals are specially valuable, as they supply both human food and clothing, the prime necessities of mankind. The clothing also includes every kind of wearing apparel, men's gloves, shoes, hats and caps, for every period or season of the year. The cheapest for general use, and the most beautiful and expensive for the most exquisite taste of wealth or for the fanciful demands of fashion. This applies alike to the sheep and Angora goat. The products of both are similar and essential.

There are three varieties of domestic goats in Turkey.

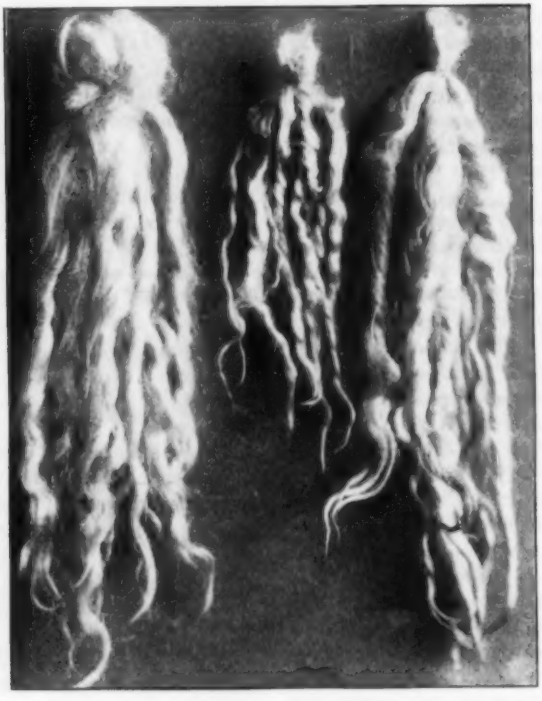
(1.) The white Angora. This has a fleece of dazzling white, hanging in curled ringlets of exquisite form and beauty. This product is the true mohair.

(2.) A goat with a rough outer and extremely fine under coat.

(3.) The common Kurd goat.

The white Angora, in its original purity, is a small, delicate animal, formerly only found in the immediate neighborhood of Angora, in Turkey. But now its stronger kindred is found in rapidly increasing numbers in Europe, Asia, South Africa, Australia and the United States. They are most numerous, however, in this country in the Southwest and West. California has a flock of 10,000.

The second variety is a Cashmere, or shell-hair goat, having a small quantity of extremely fine, soft hair, somewhat like the down of the Eider-down duck. Both are products of Nature's providence, being the result of very low temperatures in winter. The goat has an unchanging outer coat of long, coarse hair, called kemp, between the roots of which puts forth in winter the under coat of downy wool, which is cast off or shed in the spring. It is from this very small fine product that the Cashmere shawls are made by hand, and that cost large sums of money when fashionable. There is, doubtless, a kinship of blood of all of the goat tribes.



SAMPLES OF MOHAIR.

The third variety of goat is the Kurd, or common goat of Turkey. It has long, coarse hair, eight or ten inches in length, and whose fleece weighs nine to eleven pounds. The pelts tanned with the hair on make large, heavy carriage robes, that are dyed many colors. The hair is woven into Kurd cloths for tents, sacks for mohair, hand mittens for grooming horses, etc. The tanned hides form

strong leather for shoes and leggings, and leather for harness trimmings. The doe of this species yields a large supply of milk, rich in cream and casein, from which curd cheeses are extensively made, and which is a common and highly prized article of food for the natives. The outer fleece has none of the special characteristics of the true Angora. Mohair is double the value per pound of merino wool, and the fleece of the high-breds—bucks—weigh from mature animals from eight to twelve pounds.

MOHAIR DRESS GOODS.

It may not be amiss to advise the use of the pure bred sire. Very much depends on this in securing the most valuable progeny and the finest and most valuable fleeces. None but pure bred bucks should be bred from.

The Boer goat wethers lead the sheep to and from pasture, protecting them from dogs.

These Boer goats are so valuable to sheep breeders that they are worthy of a place in every flock of sheep. We import millions of dollars worth of goat and kid skins, when we have millions of acres of untilled land upon which to breed the common goats by the millions upon millions. We also import ninety-nine one-hundredths of the mohair we use.

In pasture Angoras require a close fence three feet high. A barbed wire above this or at the top of the fence will keep out dogs or other animals. Brush, salt, and water in ample supply is a necessity. And a shed for shelter against cold storms of rain and snow will also be necessary. The ground should be dry, bedded or floored, and kept clean. For feeding in these in winter, slightly elevated racks for fodder about the sides must be made, as the Angora is a neat animal, eating the coarser fodders, though fastidious as to cleanliness. Broad platforms running along the sides of the shelter gratifies a natural inclination to obtain elevation. Above these, if made, the feed racks may be placed. When cornstalks and coarse hay and straw are exclusively fed, broken ears of corn should be supplied to sufficient extent to keep the animals in good condition. A narrow, high gate should be closed, so as to protect the goats from molestation from marauding dogs.

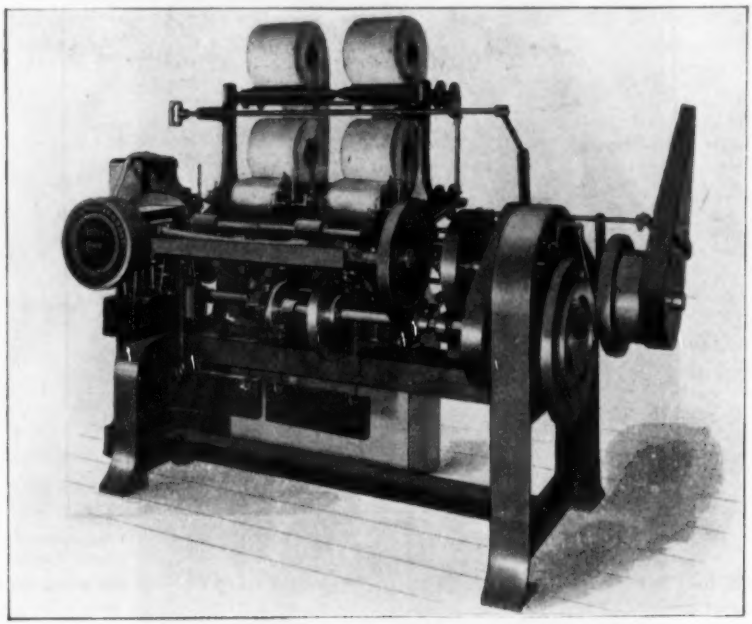
COTTON DEPARTMENT.

Nasmith's Patent Comber.

JOHN HETHERINGTON & SON, LIMITED, MANCHESTER, SOLE MAKERS.

Efforts have been made for a long time past to introduce into cotton combing machines, improvements which would have the effect of increasing the production without interfering with their efficiency as regards the quality of the product.

It will interest spinners to know that a new comber built by Messrs. John Hetherington & Sons, Ltd., of Manchester, England, is now being introduced by Stephen C. Lowe, 186 Devonshire St., Boston, Mass., the sole importer for United States and Canada, where it can be seen in actual operation. As regards quality, the builders claim that this comber is capable of complying with the most ex-



THE NASMITH COTTON COMBER.

This increase in the production of the machine has, however, been generally accompanied by a corresponding deterioration in the quality of the work. Thus the adoption of the improvements embodied in combers of the "duplex" type has been limited to those cases where it was less important to produce a smooth, silky, well laid, strong yarn, than to obtain an increased production of a slightly inferior quality.

acting demands that can be made upon a combing machine, and at the same time of handling a weight of lap much in excess of what has been satisfactorily treated on any combing machine before.

The combing cylinder is identical in position and action with the present Heilmann cylinder, but the fluted segment is, however, abolished and replaced by a plain filling up piece; the leather detaching rolls do not come

in contact with the cylinder at all.

The top comb is similar in construction to that of the Heilman machine, but is carried along with the nipper, and thus has an entirely different motion imparted to it. As the top comb is far from the cylinder, there is practically no limit to the depth of penetration into the fleece; no cam is required for its operation.

The nipper also is entirely different in construction and operation. It is completely self contained, carrying the feed roller and top comb.

The cushion plate requires no leather or cloth covering. It oscillates continuously between the combing point and detaching rollers; the motion, being obtained from a simple eccentric, is very smooth and quiet. Owing to the arrangement of the nipper springs, there is very little pressure on the nipper crank.

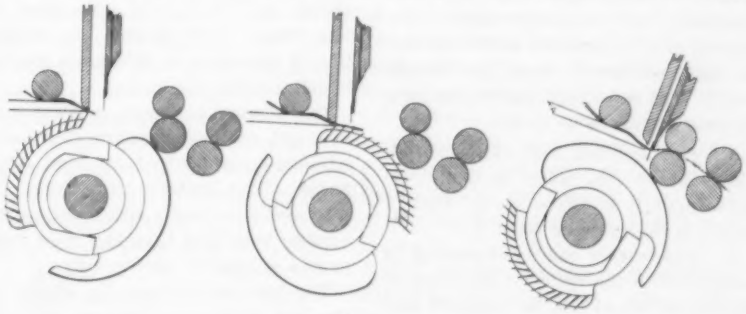


FIG. 1. FIG. 2. FIG. 3.

Before summing up the advantages of this comber we will describe the movements in detail by the aid of Figs. 1, 2 and 3, during one revolution. These diagrams show the position of the parts at three different points in one revolution of the machine.

Fig. 1 shows the machine starting to comb. The revolving cylinder carries the needles, which gradually increase in fineness, through the projecting cotton.

Fig. 2 shows the position just as the needles have passed through the tuft and when the combing is completed on the first end of the fibre. The nippers, carrying top comb and feed rolls with them, now move forward until the end of the tuft is about 3/16 inch from the steel detaching roller; at this point the nippers open. During part of this movement the detaching rollers reverse to give sufficient cotton to make the piecing; this reverse movement is only sufficient to make an even piecing. The nippers continue the forward movement and as the detaching roller moves forward, the piecing is made.

It is at this point that much of the production is gained. In the Heilmann comber the leather detaching roller must have the forward motion some time before it is brought into contact with the fluted segment. This lost motion is avoided in the Nasmith comber, and the detaching rollers thus begin to carry cotton from the beginning of their movement, drawing it at the same time through the needles of the top comb.

Fig. 3 shows the next position in which the nippers are at the point nearest to the steel detaching roller; it is at this point where the waste can be regulated, as moving the nippers further away or nearer to the detaching roller will give more or less waste. The cylinder now completes the revolution and the parts are brought to the positions already shown at Fig. 1.

Each head is independent of the others. The motion of the nipper op-

erates the feed roller so that no special mechanism is required, and the feed is varied by simply adjusting a pin. The opening and closing of the nipper itself is effected by an adjustable incline.

The nipper frame and top comb are self contained and, when once set, require no further adjustment, and can never come in contact with the needles, as the nipper knives and cushion plates are all steady pinned in working position.

The leather detaching roller is placed on top of the steel roller, on which it rolls backwards and forwards in time with the nipper. No special cam is required as the motion is obtained direct from the nipper shaft. The three principal advantages of this arrangement are:

1. The difficult and delicate adjustment of this roller is made unnecessary; it is easier to set than a roller in the drawing head.

2. The leather roller not coming in contact with the cylinder, the race of the notch wheel can be modified and greatly softened at the reversing point, so as to be smooth when starting and stopping.

3. The durability of the leather covering on the detaching roll is greatly increased, as it is constantly resting steadily on the steel roller, and is saved the shock and deflection caused by dropping continually on the fluted segment, as in the Heilmann.

By the Heilmann method of piecing much of the forward motion of the detaching roller is lost both for piecing and productive purposes owing to its motion both before and after contact with the fluted segment; in the new method of piecing such is not the case, as the whole of the forward motion of the detaching roller is effectively producing, thus, it is claimed an absolutely perfect piecing can be made with cotton 7/8 inch staple.

The machine runs easily and smoothly at 100 beats per minute, on Egyptian cotton, one yard of lap 10½ inches wide may weigh 720 grains (30 pennyweights). Further advantages claimed for this machine may be summed up as follows:

The notch wheel cam is the only one used. The machine runs smoother, and the cam races are much softer. A large saving, estimated at 50 per cent., is effected in reneedling, since when once adjusted, the cushion plates cannot possibly come in contact with the needles by roller laps on the feed rolls. The percentage of waste made is under complete control, as moving the nipper farther away or nearer to the steel detaching roller, as shown in Fig. 3, will give more or less waste. Over double the production of the ordinary Heilmann comber is claimed for this machine.

The comber has been much simplified, and complicated parts that make adjustment difficult, have been eliminated. The builders state that the machine does not require an expert comber man, and that any good carder can operate it successfully.

The new comber can be applied to the old Heilmann frames, built by Messrs. Hetherington & Sons, Ltd. One of the new combers is now at 186 Devonshire Street, Boston, and all interested are invited to call and examine it in operation.

Waste in Spinning Rooms.

I will treat the subject of making waste in the spinning room upon the assumption that the work is delivered to this room in perfect condition. Of course this is never the case, but I make this assumption to narrow the discussion down to the factors that affect the amount of waste made in this process.

In the first place skilled help should be secured and should be paid enough to keep them working steadily. Every manager is familiar with the evils connected with frequent changes in mills, and among these may be mentioned an increase in the percentage of waste.

When the overseer comes into his room in the morning he should see that the temperature and humidity are at the right point for the best results. It does not take a practical man very long to determine at what temperature and humidity the best results in spinning are obtained.

There are many other things that affect waste in addition to the skill of the hands and the degree of temperature and humidity. Every day threads are broken which means just so much waste. To obviate this, every part of the machinery must be kept clean.

To keep the parts in good order, a mule should be cleaned at least once in four weeks; during that time the back and middle roller should be kept scrupulously clean. In coarse work the middle roller will accumulate dirt that clogs up the rolls and breaks down the threads. If, however, these rolls are cleaned every week very little trouble will result.

The rolls should be oiled with pure tallow mixed to the consistency of thick cream and put on warm. Care should be taken not to get any of the oil on the leather as this will cause the surface of the leather to rough up resulting in frequent breaking of the threads. This roughness also causes the top-cleaner to lap, making lumps instead of a nice smooth lap. These lumps fall between the rolls and break the threads down. This trouble will be found in most mills.

Then again the top roller may not be adjusted in a perpendicular line with the bottom roll. This may seem unreasonable and one may say, "Well, set your rollers according to the staple and then you will be right." This is true, but it is essential to have the top rollers as well as the bottom in the right position. It is necessary to get the work so arranged that the spinner can sit down and watch it, instead of sprinting round the room as if he were in a six day foot race.

Another point to be observed and one that is generally overlooked is the unevenness of the roller covering: One side of the roller may be covered thicker than the other side. This can only be discovered by placing the rolls in an adjusting machine or a level board and then looking between the rollers and the straight edge. The thicker side of the roller will draw the yarn through the middle roll better than the thinner side. This causes lots of trouble and is especially liable to occur in the South as the covering down there is now being done by mere novices.

Another important point is the wind of the cop. This should be firm and hard. The incline should be set so as to lock deep enough and not allow any slack when backing off, particularly after doffing. Recently a little device has been brought out that will cause the mules to cross bind during winding. It is very simple and can be placed on any mule at the top of the incline on the copping rail. This device can be made by any mill machinist.

The spindle bottoms and bolsters should be kept well oiled. This oiling should be done at doffing time. The doffers should pack all the cops carefully in boxes and leave out all defective work for the spinner to inspect. These imperfect cops should be placed in a box in each alley and picked up twice a week. In this way, the overseer can keep track of the work done on each machine and apply the proper remedy for any bad work that may appear.

The size of the rollers is a very important thing. A roller with six threads makes more trouble than one with four or two threads. The former requires more care and needs covering oftener because the traverse is shorter. They are also more expensive as the covers require more leather.

The weight on the top roller should be carefully adjusted. Coarse work does not require so much weight as fine work. Care should be taken that each back weight is on the same notch. I have frequently seen spin-

ning rooms where some of the back weights would be at one end of the lever and some at the other. This causes unevenness, bad work, soft cops, etc.

Good fixers are another essential thing for a properly managed spinning room. If the mule is not adjusted properly it will not make the changes at the proper time. Frictions will frequently become struck, tearing quadrants to pieces and throwing the back shaft out, and sometimes twisting the carriage out of shape. Of course the spinner himself may be to blame for this trouble.

I have seen cases where the steel rollers were set too far apart and the spinners were compelled to have their knives or roller hooks ready from morning to night to pull lays from the rolls. When such a difficulty arises the stock should be carefully measured and the rollers adjusted accordingly.

The small help, such as the back boys should not be allowed to take the bobbins from the creels when they have two rows of roving on them. They are very liable to do this and a watch should be kept upon them and, if they are caught at such work, should be made to pay for the waste.

The floor should be kept clean. It is a very good idea to tack cloth to the bottom of the carriage and allow it to drag on the floor continuously, this will keep down all the fly waste that would otherwise get on the yarn at sweeping time. The cleaning of boards and spindle doors should be done twice a day, as a surprising amount of lint will gather there. The reels should be blown off twice every day. Two spinners should do this together, as this will keep the lint in the alley back of the mule.

Strict discipline should be maintained throughout the room. The machinery should be kept well oiled and it may be said that discipline is the oil that should be applied to the help. They should be used fairly and the overseer should see that they use the mill in the same way.

LAKEWOOD.

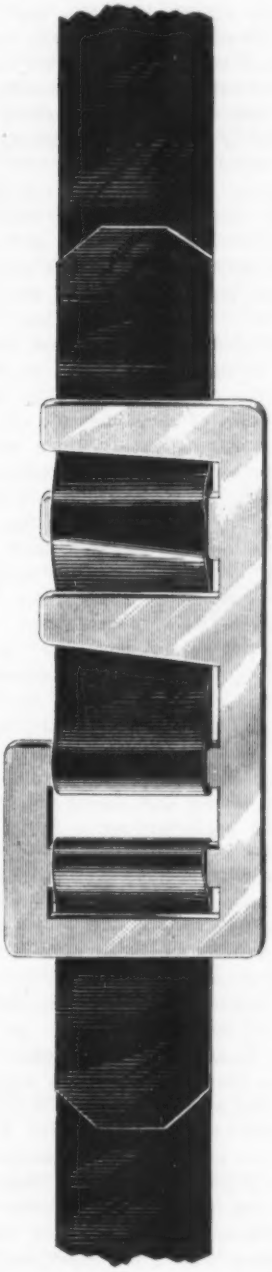
De Haven's "Trojan" Bale Tie and Buckle.

The accompanying cut illustrates the method of applying the De Haven "Trojan" Bale Tie and Buckle which the makers claim will revolutionize the present method. The material used in making the Trojan Tie is the finest cold rolled bessemer steel wire, having a special hard oil finish, which in a measure prevents rust and makes a fine appearing bale.

THE "TROJAN" BUCKLE.

The makers state that this tie is 20 to 25 per cent. cheaper than sisal and about 5 per cent. cheaper than jute. One of the main features of this tie is that it will not stretch after the press leaves the bale as the sisal does, thus saving a great deal of steamer space which is of great value. On export bales especially, it will be seen that this non-stretching feature makes it invaluable where the small heavily compressed bales for overland shipment must be very securely fastened. The buckle is made of malleable iron of the best quality, and is so constructed that, after the band is

between E and D are openings to allow the passage of the hot air from the spinning room into the card room. In this manner, the air in both rooms is properly applied, there is no end or protruding part to interfere with handling on runways, etc.



THE "TROJAN" TIE AND BUCKLE.

This tie and buckle have been submitted to some of the largest commission houses and foreign brokers, and it is generally conceded that it will be an unqualified success. It is stated that in all probability the foreign agents of New York and Boston houses will be so pleased with the fine appearance of the bales that they will in future demand this tie.

As to attaching the band, it may be said that after a few days trial the men become very expert at this work, and the bands can be adjusted with as much ease and rapidity as rope. The material is put up in coils of 50 to 75 lbs. each continuous length packed in barrels containing 500 to 600 lbs. each, or, if desired, it can be cut to lengths ordered and packed in bundles. It is, however, much more convenient to handle, more easily stored, and in many ways more economical for the mills to receive the material in the coils and do their own cutting, especially if a number of sizes are required. Further information regarding this important device can be obtained from the De Haven Manufacturing Company, 50-52-54 Columbia Heights, Brooklyn, New York, the well known makers of the De Haven ring travelers and twisters.

Speed of Cotton Spindles.

Editor Textile World:

In your February issue there is an article, Speed of Cotton Spindles, by Waaren, on which I wish to say a few words. He states there is a tendency to generalize and not enough explanation of details in a great many articles. I thoroughly agree with him on that point, and at times it is very misleading to those not thoroughly posted, to simply state without giving reasons what can or cannot be done.

Waaren criticises an article of mine in your January issue; he speaks of it as being misleading to the uninitiated, by conveying the idea that the limit to the speed of spindles is the mechanical limit. The article referred to must have been misleading indeed, if that was the conclusion arrived at by Waaren after reading it. What I meant to show was the difference in speed of spindles on frames as compared with mules, and also some reasons why mule spindles could not be run as fast as those on frames.

If Waaren is a practical spinner, or even if he is not very practical, he must know it would be an utter impossibility to run spindles to 12,000 revolutions per minute on coarse numbers of yarn, not because the spindle could not stand the speed all right, but because it would be impossible to run other parts of the frame, principally the rolls, to a corresponding speed. Take No. 10 warp yarn for example with the speed of the front roll 150 revolutions per minute; this would require a spindle speed of only 6700 revolutions per minute. Then take No. 50 warp yarn, which we will call a medium size, with speed of front roll 125 revolutions per minute; this would require a spindle speed of about 12,000 revolutions per minute. Then again take No. 80 warp yarn with a front roll speed of 110 revolutions per minute; this would require a spindle speed of about 13,800 revolutions per minute. The last named is the finest number I have ever spun on a frame, but I have seen 120s spun successfully and even as high as No. 150.

The above speeds I have put pretty high, and they would require good, even stock. I have taken them as examples to convince Waaren and those supposed superintendents and agents he speaks of, that the limit of speed is not in the spindle. It would not, therefore, be a very hard job for a practical spinner to show any superintendent or agent, no matter how little they knew about spinning, the utter absurdity of spindles running 12,000 revolutions or over on coarse numbers of yarn, and it is high time any overseer of spinning who cannot convince them and prove by ocular demonstration the impracticability of such speeds on coarse numbers was looking up a fresh job or getting into some other line of business.

Waaren speaks of slowing down speeds and getting more work off under certain conditions. He must not forget that drafts play a very important part in spinning yarn; in fact, not only in spinning, but in all the different processes cotton has to pass through from bale to cloth. Upon the method of drawing cotton and weight of sliver depends the success in making yarn. When we see an overseer, no matter in which department, running around with a wrench in his hand and cutting and slashing promiscuously without first taking his bearings, we may arrive at the conclusion there is a screw loose somewhere. He should first consider that every improper change makes other changes compulsory, and that all points should be carefully considered before starting in. Every change, however insignificant, slightly disarranges the equilibrium of the process and should not, therefore, be made without a full understanding of the reason why.

It is very evident that there is an over plus of spindles in the mill Waaren refers to, but that is not the case in the majority of modern mills where a certain number of spindles must produce a certain weight of yarn; if this is not done we are likely to hear something drop. Assuming that the carder can keep up with the spinning, I believe that it is better to employ shorter drafts when you get a poor lot of cotton.

The point is, and is an important one to us, that we should never disturb the supply and demand, unless we know and are fully convinced these have been tampered with on a

previous occasion to the detriment of the product.

I would like to draw Warren's attention to his own article, and ask him to read it over calmly, carefully and thoughtfully, and see if he has not been guilty of the very offence he condemns in others. His whole article is nothing but generalizing and theorizing without one practical suggestion.

He says a good many things which are true, but does not offer any remedy whereby the uninitiated can overcome what he condemns, or secure any assistance in practicing the maxims he lays down.

We would like to hear from you again Warren, and please let your next communication be more practical and with not so much generalizing.

MOHAWK.

A Stop Motion for Cards.

A perspective view of a new stop motion for cotton cards is shown at Fig. 1

The lower roll has spindles journaled in boxes. The upper roll has spindles mounted in slots and capable of a vertical movement. A yoke, having upwardly extending arms and a cross-bar, is attached to the spindles by means of boxes secured to the ends of the arms.

A lever is connected to the cross-bar. The outer end of the lever bears a downwardly extending arm, provided with a screw-shank and a bifurcated head.

The bifurcated head is pivotally attached to an arm with a catch plate, pivoted to an arm on a stud, adjustably mounted in a slot. The catch plate is traversed by two intersecting slots, inclosing a V-shaped tongue, having a blunt vertex.

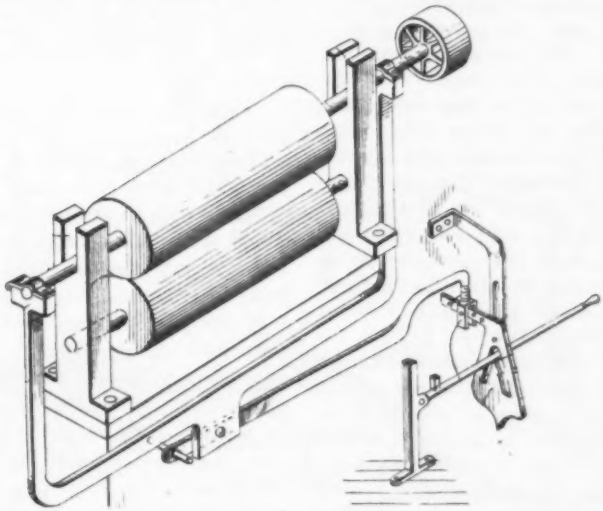


FIG. 1.

A lever fulcrumed at one end on a standard rests on the vertex. This lever is arranged by means not shown in the drawing to throw the doffer mechanism of the machine out of gear when the lever is displaced from its position on the vertex. By this arrangement any displacement of the yoke would be immediately transmitted to the catch plate.

When in operation, the catch member is adjusted to hang vertical with the lever resting on the vertex when a normal thickness of cotton is passing through the calender-rolls.

WOOLEN DEPARTMENT.

Picker Rooms.

SAM DRIVER.

"The fear of the Lord is the beginning of wisdom."

This is the inscription carved out of granite, and extending across the whole front of a store near the post office in the city of Albany, N. Y.

I am impressed with the truth of these words when going into some of the dark, dirty, dingy places, more like cold storage rooms than anything else, that serve for picking rooms in our mills. Why not have good, light, warm, large picker rooms? Oh, no! Any old out of the way cubby hole will do for the picker room. One needs the fear of God, and wisdom too, to go into some of those I have been in, and should not be afraid of the devil, either, for some of the machines in them are more like devils than wool pickers. In some parts of England, they call the fearnaught pickers "wool devils."

When I start to work in a new place, the super will show me around the card room, then he will show me the picker room in some out of the way place, which is reached by passing through this room and that room, upstairs and downstairs, indoors and outdoors, landing somewhere in the yard and finally reaching what is called the picker room by passing through a dark alleyway and, perhaps, up another flight of stairs. When I have occasion to visit the room again, I need a guide to show me the way.

Arriving at the picker room, the super almost always shows me the burr picker first and says:

"Mr. Driver, we have a great deal of trouble with our burr picker; it cuts up the stock and keeps choking up, and we can't do anything with it. I wish you would look at it when you get a chance."

I am then introduced to the boss picker man, after which we return to the card room, where the super leaves me. I go round the card room the rest of the day examining the batches to see how they feel and how they look, and making a few inquiries, etc. Night comes and I get supper and think I have got along well for the first day, not having heard a single complaint.

Next morning, accompanied by a guide, I start for the picker room and find the boss picker on hand.

"Well, Bob, how goes it this morning?"

"Very well, only the burr picker don't go."

"Let us look at it," I said, "what is the matter with it"

We go over to the burr picker and I find that it is a Parkhurst and that the burr cylinders are filled up with gum, and the brush is fully half an inch off the back burr cylinder, and the outlet choked up with dirt and gum. This is the way I often find the burr pickers, Parkhurst, Sargent, Curtis & Marble and others. Some I find with the brushes worn down to the wood; some with new brushes put on wrong; perhaps two brushes out of the lot touch the burr cylinder; the rest are from 1/4 to 1/2 an inch off. How can burr pickers run in such shape? Many a good carder has lost his job through these things.

I always make it a point in my experience to see what they are doing in the picker room and how they are doing it. It needs wisdom and judgment to get work just right in the picker room. By the time I had finished up the examination of the burr picker, Bob, the picker man had begun to layer down a batch.

"Bob," I said, "what do you put on these lots?"

"We put on 'slush,'" was his reply.

"What is 'slush' Bob?"

"Oh! it is a kind of mixture of borax and soap and oil and water, and we put it on boiling hot."

"So you call it 'slush' do you, Bob?"

"Yes."

"Well, Bob, how much 'slush' to a 100 lbs. do you put on?"

"Oh! I don't know the weight of the batches, I just put on so many pailfuls to each layer."

"Bob, how do you put the 'slush' on the stock?"

"Why, we use an old lard pail with holes punched in the bottom. Wait a minute and I will show you how we put it on. It is all right, too."

"HE SEEMED TO FEEL HIS SMARTNESS AS AN INVENTOR."

Then he takes a pailful of "slush" in one hand and the old lard pail in the other and shows me his invention for putting on "slush," saying at the same time:

"We used to put it on with an old broom, but this is much better."

He seemed to feel his smartness as an inventor, and said he was thinking of getting it patented, as it was an improvement over the old broom.

"Bob, how often do you put these batches through the mixing picker?"

"Well, Mr. Driver, sometimes we put them through once; sometimes twice, if we have a very hard mix."

How can a carder make even work with such a picking room to supply him with material? And yet these are facts, and this is the way picker rooms are run in some of the best mills. The consequence is uneven work, rowey goods, changing carders and supers. If the picker room is run in the way I describe, supers need to fear God and gain wisdom in order to make up batches that will be cheap and good and make passable cloth.

Another trouble with the picker room is that the very cheapest help is hired for the dirty, oily work to be done. Just think of being soaked in "slush" all day long for 80 cents or $1.00 per day; perhaps the boss may get $1.25 per day. Can they expect the work to be done right? No! The men will shirk every chance they get, and will swear they have put the lot through three times when they have only put it through twice.

When I left Bob to go into the card room, I gave him instructions to clean the burr picker out in good shape, to clean the burr cylinders and the fans, and to scrape of the gum, which was 1/4 inch thick, from the edges of the

brushes. How could the brush do good work in such shape?

"Well," said Bob, "how am I to clean out the burr cylinders? I have nothing to clean them with."

"Well, Bob, find some old files, take them to the blacksmith and have him flatten out the handles thin enough to clean the cylinder; or find some hoop iron that is thin enough."

Bob found some hoop iron and I showed him how to cut it; hoop iron does very well, if you have nothing else.

I then left Bob in the picker room, after telling him to let me know when he had the picker cleaned and was ready for the next batch.

Arriving in the card room, I found the boss spinner looking for me. He said:

"Say, I don't know your name yet, and I know you have not been here more than a day, but I tell you we are having some awful uneven, bad, lumpy work. Can't do anything with it. I wish you would look at Nos. 6 and 9 cards; perhaps you can fix them in a minute."

"All right," I said, "I will do so," and went to look them over.

(To be continued.)

Finishing Wool and Mixed Fabrics.

XII.

BY N. REISER.

Translated from the German for the Textile World.

Continued from March.

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The fulling mill is a machine that requires careful oversight to avoid damage to the goods. The bearings should be kept well oiled to prevent their wearing down and disarranging the adjustment of the rolls and trap. All bearings should if possible be outside of the machine to prevent oil from getting on the goods. When bearings are inside, oil that saponifies easily should be used. Mineral oil causes bad stains on woolen cloth. When the machines are to stand for any considerable time, the rolls should be tightly covered with wet cloth, which should be moistened every other day; this is to prevent the wool from drying out.

The fuller should examine the pieces soon after they have commenced running, and not let them run with the idea that the goods will come right without careful attention. It frequently happens that from inattention on the part of the fuller the goods are injured beyond repair.

It sometimes happens that, in spite of every known expedient, the fuller finds it impossible to full the goods according to directions; in such an event he should report the facts promptly to his superior in authority and not wait for the latter to discover the difficulty himself after a greater or less quantity of goods have been damaged. Such faults can be corrected by the mill manager by changing the lay out of the fabric.

Sometimes it happens that a fabric that has been working all right cannot be fulled properly. This may arise from various causes, such as: a change of material; a change in the method of handling in previous processes; alteration in size or twist of the yarn; change in the number of picks put in by the weaver. The remedy for such difficulties is the affair of the mill manager, and not that of the fuller. The cloth that is to be shrunk in both length and width should be shrunk in both directions at the same time, in place of first shrinking it in one way and then in the other.

The pieces should be carefully examined for imperfections as soon as they come from the fulling mill, otherwise defects such as holes, streaks, etc., caused in the fulling mill may not be discovered until the goods have reached other processes, and then the fault may be unjustly placed upon the wrong workman.

Great damage is often caused by

fulling mill wrinkles in the goods. These may be caused in various ways, such as: 1, Letting the goods run too long without overhauling. Changing the folds is very important, especially with heavy, stiff, hard felted fabrics. It is sometimes advisable to turn the pieces end for end in the mill, thus changing the direction of their passage through the rolls; 2. Letting the pieces run too dry; 3. Rolling selveges, in which case the streaks are on the edges of the pieces; 4. Chafing by the rollers; 5. Laying the goods too wide in the loom, which results in their fulling too long, giving the face of the cloth a streaky appearance; 6. Too much pressure on the rolls; 7. Fulling in the width only, and not lengthways; 8. Irregular seams, causing streaks for a short distance from the ends of the pieces; 9. A soap that is too heavy will cause streaks, and retard the fulling.

Spots arise in fulling from many different causes, among which may be mentioned the following: 1. Insufficient rinsing of the dyed wool; if two or more colors are in the goods, the loose dye from one is dissolved in the fulling and stains the other colors; 2. Fulling or washing light and dark pieces together; 3. The use of too much alkali; 4. Applying strong alkali carelessly on the goods; 5. Running weak colors too warm, or applying soap that is too warm; 6, Hastening the scouring process too much. This results in only the loose dirt and grease being carried off, while more or less is left in the goods. This is a frequent cause of spots in piece dyed goods; 7, The presence of lime in the water, causing an insoluble deposit on the goods. 8. Dirt and grease from the machines getting on the pieces. 9. Prolonging unduly the washing or fulling process; as, for instance, leaving the operation uncompleted over night; 10, Imperfect rinsing after scouring or fulling; 11. Leaving in the wet state too long goods dyed with fugitive colors; 12. Handling together dark and light colored pieces in the wet state.

It often happens that the selvage of the goods will roll in washing and fulling. This is not the fault of the finisher, and the only remedy he can apply is to tack or sew the selvages together, and full and wash the goods in this form, as shown at Fig. 40. The pieces should be tacked, so that the selvage will roll outwards, as shown in the lower part of the illustration. A circular stitch should not be used, but the edges should be tacked so as to hold them in a flat position against each other. Following are some of the causes of rolling selvages:

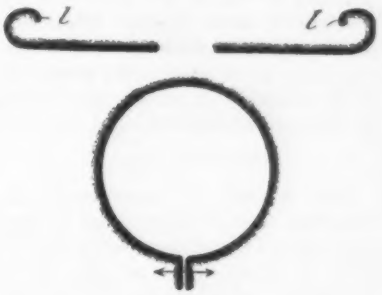


FIG. 40.

1. Weaves in which the warp or filling predominates on the one side or the other, such as satin and similar weaves. The selvage cannot be woven in the same way, but must be made with a rib, basket or plain weave; 2. A material in the selvage that fulls quicker than the cloth itself, resulting in the selvage becoming shorter and rolling. Twisting the selvage yarn harder, or warping it slacker, may help matters in such a case; 3, The use of too narrow a selvage in goods that are fulled too hard. If the weave of the goods is one sided, that is, if the warp or filling predominates on one side or the other, the filling will shrink if the selvage is not wide enough to resist the pull, and will be drawn in and rolled; 4. Reeding the selvage threads too close together. With the exception of No.

1. this is the most common cause for rolling selvages; 5. Using a weave for the selvage in which the warp or filling predominates on the face. The best weaves are plain, filling or warp rib and basket.

In every well organized weave room detailed directions for weaving the selvage should be given in advance. Selvages are frequently neglected in spite of the fact that it is a very important point in manufacturing cloths. An even, well made, and well appearing selvage adds materially to the market value of the goods.

Colors that have been dulled in washing or fulling can sometimes be restored to their original brightness by treating in a weak solution of sulphuric or acetic acid. This treatment is not adapted for browns and blacks as they are thereby reddened.

CARBONIZATION.

The process of carbonizing the vegetable matter in wool can be carried on when the material is in the form of loose stock or after it is woven into cloth; in the latter case, the cloth may be carbonized before scouring, or immediately after fulling, gigging or dyeing. It has been claimed that there is an advantage in carbonizing before scouring, as the wool fibre is then better protected from the action of the acid. My experience does not confirm this view. Cloths carbonized before washing can seldom be colored in even shades.

There is an important difference in carbonizing before and after fulling. If carbonized before fulling, the liquor penetrates the fabric better, and the vegetable material is much more easily removed that if the goods are first fulled. There is, however, the disadvantage that carbonized goods do not full as well; then again, the waste is larger in fulling. Some claim that the goods should be carbonized only after gigging, since then the vegetable material has been loosened up and is acted upon more strongly by the liquor.

Carbonizing the cloth after dyeing can be successfully performed only when the colors have been made with the so-called acid dyes; the color comes out uniform, and there is less danger of spots and clouds.

Woolen cloth can be carbonized with sulphuric acid or muriatic acid solutions, acid vapor, chloride of aluminum or magnesia. A wood, stone, cement or glass cistern is used; if made of wood, the tank is generally lined with lead.

The strength of the acid solution varies from 3½ degrees to 7 degrees B. The material to be carbonized must be freed from soap, otherwise, the efficiency of the acid will be impaired. The liquor should not be used too long or allowed to become dirty; the strength should be frequently tested and kept uniform. The goods are immersed in the liquor and allowed to remain until thoroughly and uniformly saturated. They are then well extracted, the surplus liquor being carried back to the soaking tank.

After extracting, the pieces should be dried and carbonized as soon as possible. They should be kept from the light while in the wet state and while drying, since bright sunlight or even ordinary daylight converts the acid into a powerful bleaching agent, resulting in irregular coloring of the goods. While wet, the goods should be carefully guarded from heat. When carbonizing with chloride of aluminum, it is very important that the goods should be clean, since, otherwise, they will handle sticky and disagreeable. When sulphuric acid is used, the goods should be first dried at a temperature of from 40 degrees to 45 degrees C., and then the temperature should be raised to about 75 degrees C. If chloride of aluminum is used, the cloth should first be dried at 40 to 45 degrees, after which the temperature is raised to about 100 degrees C.

The duration of the drying process varies between 3 and 6 hours, accord-

ing to the weight of the fabric and the quantity of the vegetable material present. If the goods are to be neutralized, they should be first rinsed in clear water and then treated with a soda solution 3 degrees to 7 degrees B. Care should be taken to apply the alkali uniformly and not to have it strike the goods suddenly, as in the latter case spots may be caused.

Carding and Spinning Low Stock.

However carefully the blend or mix be made, whether it be of wools of different colors or qualities, or of admixtures of wool, shoddy, or cotton in various proportions, it is advisable to run the hand-blended material through the tenter-hook willy (Fig. 1).

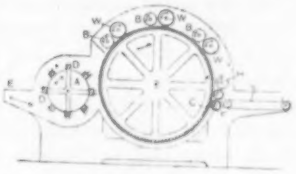


FIG. 1

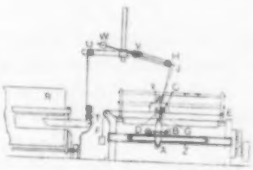


FIG. 3

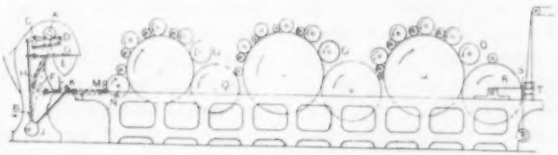


FIG. 2

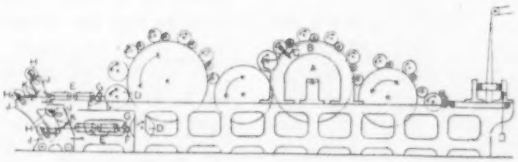


FIG. 4

The material is spread by hand upon the feed lattice L, which delivers it slowly to the spiked wooden rollers, F, which latter hold it against the action of the similarly-spiked cylinder, C, striking upwards, as shown by the arrow. The upper feed roller, F, is cleared by the wooden brush roller, H, set with several rows of hair bristles as shown, similar clearers, B, acting upon each of the workers, W, to strip off the material retained by their teeth, and to deliver it again to the cylinder, C.

The cylinder is stripped by the fan, A, revolving at a high speed in the direction shown; the now thoroughly opened and mixed material being thrown out at the opening, E, into an enclosed settling chamber of sufficient capacity to allow the air to settle and the material to fall.

The teeth of the workers and cylinder are of flat forged steel about 1/8 in. thick, and of cock-spur or tenter-hook shape, driven into the beech lags with which these rollers are covered, in rows arranged in such a way in the cylinder and workers that, although set close, the teeth may not come in contact.

Of the wooden staves, D, forming the rails of the fan, every alternate one is furnished with two rows of straight spikes, and the others have but one row of spikes and a strip of leather which rubs against the teeth of the cylinder and keeps them clean.

The upper portion of the machine is enclosed by a wooden cover to pre-

vent dust and waste flying off, while the under-covers are in the form of grids, which allow heavy impurities to fall through. The workers are driven slowly round in the direction shown by means of a chain and sprocket wheels, while the strippers and fan are driven at a comparatively high speed by one and the same belt from a pulley upon the cylinder axle.

The now mixed and opened stock is removed by hand from the settling chamber in the rear of the willy already referred to, and placed in the hopper, H. of the automatic feeding machine shown to the extreme left of Fig. 2.

Leaving the automatic feeder, the material transfers itself to that of the scribbler proper, which delivers it to feed rollers, M, about 3 in. in diameter. The "licker-in," N, takes up the wool as delivered by the feed rollers and carries it forward towards the first cylinder, or "breast," as it is often called. The wool is not delivered direct to this cylinder by the licker-in, but is transferred to it by an "angle" stripper, as shown.

Three pairs of workers and strippers are shown upon the upper portion of the breast.

The doffer, Q, carries the stock forward towards the next cylinder, to which it is transferred by another angle stripper, as shown. The same operations are repeated over the back and front swifts before the doffer, R, is reached, and the web is doffed by a comb, S, which is given a rapid vibratory motion by means of an eccentric and rod. as shown.

A lancewood lathe attached to the comb stock and pedestal supporting the doffer forms a radius bar which keeps the knife at its proper distance. The small roller shown on the top of the doffer, R, is placed there for the purpose of keeping the clothing of that doffer clean and in good, keen condition.

The fleece, as doffed from the last doffer of the scribbler, is carried away by a narrow lattice which runs parallel with and close to the face of the roller. This lattice runs round the lower of the three condensing rollers T, so that the scribbled material is formed into a sliver some 4 in. wide, compressed and strengthened in passing between the heavy rollers T.

This method of taking off the fleece from the scribbler is known as the Scotch feed arrangement, by means of which the material is transferred from the scribbler to the carder. Another and more complete view is given of this arrangement in Fig. 3. Taking both together, it may be seen that the sliver passes from the calender rollers, T, to the lattice carrier, U V, and thence over the swinging arm, W, to the feed lattice or sheet of the carder (Fig. 4), upon which it is spread by the traveling carriage Y.

In order that the Scotch feed may work smoothly and correctly it is advisable to have the pulley, V, vertically above the rollers, T, and the centre of the arc in which H swings vertically over the carriage when in the centre of its travel. The end, H, is pulled downwards, and all strain kept off the sliver by attaching the end of the rod, J, to the carriage by means of a cord. The speed of the carriage and the rollers which it contains must be made to correspond with the rate of delivery of the rollers T, so that the sliver may be kept tight without being broken.

The surface speed of the feed lattice of the carder must likewise be so made to conform with the speed of delivery of sliver to it that its entire surface may be equally covered without interruption, the edge of one row of sliver overlapping the one preceding in a regular manner.

The fact that the Scotch feeding arrangement presents the fibres to the cards crosswise and not endwise is immaterial in wool where it is often desired to obtain as bulky a thread as possible, in which the fibres are much crossed and outstanding, rendering the yarn more rich in felting properties. Until we come to the last swift

of the carder, the arrangement of feeds, licker-in, angle strippers, breast, swifts, workers, strippers, doffers, and fancies, is similar to that already described for the scribbler.

The manner in which the swifts and their surrounding rollers are supported by means of "bends" is shown in connection with the swift A (Fig. 4). The bends, B, are castings of semi-circular or horse-shoe form bolted to the sides of the framing. The fancy is supported upon a projection, as shown, while the workers and strippers work in brasses socketed upon the ends of screwed spindles held in a position quite radial to the swift by metal straps.

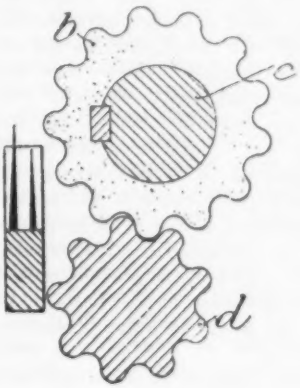
The condenser, shown at left of Fig. 4, is known as a double doffer, tandem rubber, six or eight bobbiner. Such a machine is capable of making as many as 96 good ends and 2 waste ends from the fleece taken from a carder 60 in. wide.

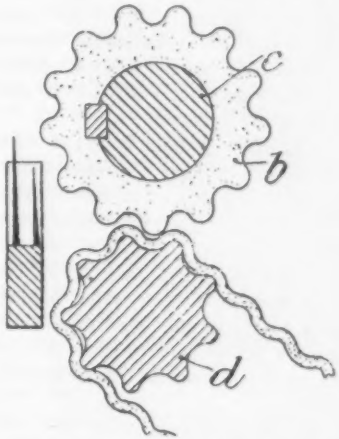
The ring doffers are stripped by small stripping rollers F covered with fine filleting, which are in turn stripped by smaller but similar stripping rollers G. Dividing rollers are now often introduced between the stripper and the rubber leathers, especially in fine machines, where difficulty is often experienced in keeping the threads apart by reason of long fibres and hairs which unite them.—Textile Manufacturer.

Rollers for Gill Boxes.

The gill box rolls shown at Fig. 1 are operated without the customary leather apron. The outer covering, b, of the upper roll is made of leather pressed very hard. The core, c, of this roll is of metal.

The leather cover, b, can be readily replaced when worn. As the leather surface is corrugated to correspond with the lower roll, the new covering





does not need to be run for a time before it will do good work, as is the case with leather aprons. Another advantage claimed for this new roll, which has been patented in France, is the ability to bring the faller pins closer to the rollers than is possible when aprons are used. This leather covered roll is said to be better than the metal rolls even when the apron is retained, as it results in a saving of the apron by avoiding the severe action of two metal rolls on the leather, Fig. 2 shows a pair of the new rolls equipped with an apron.

—One should remain silent or speak what is better than silence.—Greek proverb.

KNITTING DEPARTMENT

The Knit Goods Situation.

In the underwear market the buyer is looking for fall goods already ordered, and his mind is occupied with plans to dispose of the goods contracted for some time ago.

Under these conditions, business is naturally quiet. There is a well defined belief that the reorder business on spring goods is to be large. This belief is founded on the fact that stocks in retailers' hands are not large, while the purchasing power and disposition of the public is probably larger than at any time in the history of the country.

The advance in the price of raw cotton is sure to have a strengthening effect on knit goods of all kinds. The knitters for the past two years have steadily pursued a hand to mouth policy in purchasing yarn. The result is that now their store houses contain no stocks that were purchased at the low water mark reached on the yarn market during the past eighteen months.

A call for knit goods now will find the knitters face to face with the problem presented by cost and selling price, and if would-be buyers are unwilling to pay prices that afford a living profit, they are likely to find their offers turned down without delay.

The deliveries of fall goods are just beginning and buyers have shown a desire to have orders filled earlier than in previous years.

Balbriggans are in good demand; in fact there is a well defined scarcity in this line of underwear. Balbriggan goods have to a large extent displaced ribbed goods, particularly in men's wear.

Fleece and wool goods are draggy; mills making them are, with few exceptions, running slack and trying to figure out how to make a profit when cost equals the net price of the product. Here, as in many other lines of merchandise, the business has been demoralized by the avalanche of cheap trash dumped on the market, and exhibiting all the qualities that knit underwear should not possess. The garments of this class as they come from the boxes look like seconds and in many cases really are seconds. After salesmen have become worn out and discouraged in the attempt to convince buyers that the goods are worth as much as if well made, the inevitable follows, and the price is cut. These low prices are then reported by buyers throughout the length and breadth of the market as a reduction in the price of underwear. The manufacturer who is turning out a well made product cannot disprove the assertion and is forced to reduce his prices in order to sell his production.

In light weight goods there is a strong belief that there will be a good reorder business. The prosperous condition of the country is well known. The consumer wants goods and has the money to pay for them. Labor is well repaid, and the money paid out in this way goes into immediate and active circulation.

In hosiery the same quiet prevails as in the underwear trade, but there has, nevertheless, been a fair volume of late orders coming from cautious dealers who did not place orders early in the season, but who have become convinced that there is a very satisfactory spring business in store for the dealers who find themselves prepared. The demand for lace effects continues as pronounced as ever, and complaints are heard on the score of non deliveries.

In plain goods the situation is not so favorable, but there is no disposition shown to cut prices in order to move stocks. Wool hosiery is the weakest spot in the trade, and here the demoralization is due to the large production of inferior goods, inferior in color, weight, quality and general workmanship. Manufacturers of well made goods have been forced to cut their own prices in competition with such goods. The trouble has been aggravated by the inability to diversify the product of a mill adapted for woolen hosiery to meet current demand.

The Deutsche Wirker Zeitung states that no appreciable change has taken place in the Chemnitz hosiery market since the report from which we quoted in our March issue. New orders are coming in daily, many of them given without specified dates of delivery. The same journal expresses the hope that the active business of last summer will be duplicated during the coming season, but adds that very few well informed persons in the trade believe this will be the case. There is a scarcity of heavy goods. Activity is especially marked in the glove trade, and orders are now being placed for winter goods, with early deliveries specified, in order that the buyers may not be caught napping when the demand comes. In the underwear trade, the conditions in the Chemnitz market are reported as depressed. While for summer articles good orders have been secured for the foreign trade, heavy goods on the contrary are a drug on the market. The journal referred to states that foreign tariffs have succeeded in practically destroying the German export trade in heavy underwear, leaving only the German market for German knitters in this line of goods.

—Pardon others often and yourself never.—Balzac.

—The heart of a statesman should be in his head.—Napoleon.

Irregular Shrinkage of Cotton Knit Fabric.

In the Question and Answer Department of this issue will be found a question from "Aztec" No. 228, asking about the irregular shrink of cotton knit cloth for cutting. We have submitted it to several practical men, and have received the following opinions:

Editor Textile World:

Referring to the question in regard to irregular lengths of union suits, I do not believe there is any way of shrinking cotton knit cloth so that you will not have to make any allowance for shrinkage, but the garments should all shrink about the same, so that when the goods are finished they will be very nearly uniform. If the cloth is not all knit the same and handled the same from the knitting machine to cutter, the lengths of the garments will vary. For instance: take two pieces of cloth knit on the same machine and with the same yarn, one knit with a loose stitch and the other with a tight stitch; cut these exactly the same, and you will find that the loose knit garment will be shorter than the tight one when finished. Cloth knit with a tight take-up, and with a loose take-up will also vary. The only way to have the goods come out evenly when finished, is to first see that your yarn is running even; then see to it that your machines are all knitting the same number of stitches to the inch, and that the take-ups are all working evenly; do not have one machine running with a tight take-up and the next one with a loose one; or one with a tight stitch and one with a loose one, for, if you do, you will have to make different allowances for each and every machine.

Do not have the cloth rolled up on rolls either at the knitting machine or anywhere else throughout the mill, if you can possibly avoid it, as the uneven tension the cloth gets in being

rolled, will make an uneven shrinkage after leaving the cutter.

As good a way as any I know of to shrink the cloth, is to steam it and then run it through hot rollers to dry. This process has a tendency to put a gloss on the goods rather than take it off. BADGER.

Editor Textile World:

Referring to your question as to irregular lengths of union suits, if the party will build a steam box that will hold dry, live steam so there will not be any dripping on the goods, and steam from five to ten minutes, the cloth will shrink so it will not go up any more. Care should be taken to have the cloth laid out nice and smooth and wrapped up in cloth; if this is done, I do not think the gloss will be taken off. TOGA.

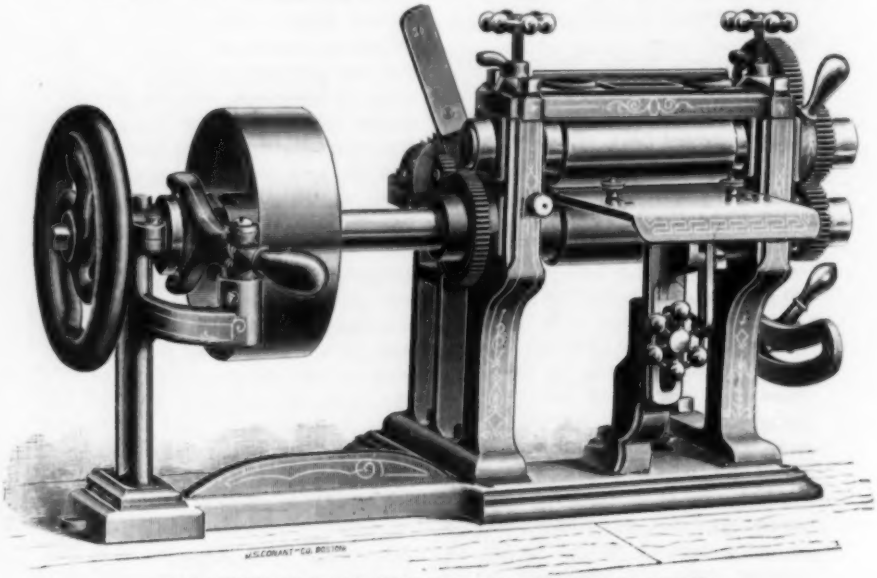
Editor Textile World:

Referring to your question regarding irregular lengths of men's union suits, I do not know of any make of machines for shrinking cotton cloth. The common practice for this class of goods is to roll the goods up by a web rolling machine; this machine rolls the goods uniform in width and stretches them equally throughout their entire length, which is a great advantage in cutting the fabric into under shirts and other garments.

FOREMAN.

The Folding and Cutting of Stays, Facings and Bands by Automatic Machinery.

One of the most important operations connected with the manufacture of knit underwear, is the finishing,



THE KENNEDY BAND FOLDING AND CUTTING MACHINE.

and it is the aim of advanced manufacturers to obtain the very best and most improved kinds of machinery for this department. An important part of the finishing is the making of attractive and neatly folded button stays, button-hole facings, drawer-bands, etc.

The hand methods used in some mills are not only highly expensive, but the work is not turned out with any degree of accuracy. Some bands will be too long; others will be too short, while some will not be folded evenly. To overcome this difficulty, to make a more accurate and evenly folded band and at the same time to

turn the work out with great rapidity, the automatic band folding and cutting machine was designed. This machine has practically revolutionized the process formerly used for making bands, etc. During the last year many improvements have been made and the builders firmly believe that they have at last a perfect machine.

The workmanship is the very best that skilled mechanics do. One of the best testimonials that this machine has received is, "that it is built like a good sewing machine." The machine is very simple in construction and does not need the services of a skilled operator; a young girl can run it successfully, as it is automatic and does about all the work. All the gears are cut and there is nothing to get out of order. The latest machine has been thoroughly tested, and the builders state that, for accuracy, rapidity, ease of operation and durability, it cannot be surpassed.

The manufacturer of and owner of all patents on this band folding and cutting machine, is Thos. Kennedy, Cohoes, N. Y., who will furnish samples, testimonials, and any information connected with same.

—It is reported that the ramie industry in Mexico is in a promising condition. A decorticating machine has been in operation in the state of Vera Cruz for the past three years. The report states that this machine will handle the cutting from one acre, six tons of green ramie, in ten hours. Five crops per year are raised, yielding 2500 lbs. of dry fibre.

Tracing Goods Through Dyehouse and Finishing Room.

These few words in regard to tracing goods through dyehouse and finishing room are submitted with the hope that they may aid knitters in finding out "where they are at." Below will be found a method that has given satisfactory results; it enables one to know at any time just where the goods are. Before sending goods to the dyehouse, each style is distinguished by a letter or number and is sent down in lots of from 50 to 100 pounds or in whatever quantity is most convenient.

Date.	March
Lot No.	1
No. Doz.	45
Style.	A
Size.	9
Color.	Black
Weight.	100
Ins. No.	

FIG. 1.

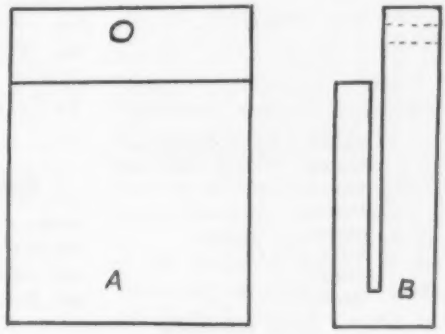


FIG. 2.

We will begin with style A, size 9, of which it takes 45 dozen to weigh 100 lbs.; the first two lots we will enter in the dye book in the following manner:

Lot No.	No. Doz.	Style.	Size.	Weight.
1	45	A	9	100
2	50	B	7	100

The day's work is recorded in this way. The lot numbers begin with No. 1 and continue in numerical order day after day until No. 100 or any other number that may be selected is reached; a new series should not be begun until No. 1 is finished and out of the way; this is to prevent two lots of the same number being in the room

at the same time. Each lot will be accompanied by a ticket similar to that shown in Fig. 1; this ticket corresponds with lot No. 1 on dyebook, and is kept with the goods until they get to the boarder.

After reaching the dyehouse, the first process, if the goods are to be dyed an oxydized fast black, is to put them through the tom-tom; here the ticket belonging to the lot is hung on the tom-tom in a small piece of a board that is split part way through,

The boarder's account must correspond with the ticket, after which it is destroyed. After the goods are boarded, they are sent to the presser accompanied with the ticket shown in Fig. 3; this ticket follows the goods through all the other processes until they are packed. On reaching the packer, the finishing ticket alone remains, as the other coupons have been detached during the various processes, each operative retaining her respective coupon, filling out same and retaining

Finishing Ticket.

Lot No. 1 Date Mar 12 1902
Style No. a
Color Black

Size	4	4½	5	5½	6	6½	7	7½
No. Doz.								
Size	8	8½	9	9½	10	10½	11	11½
No. Doz.			45					

Boarded by Dick Deadeye
Pressed by Little Buttercup
Paired by 45
Mended by 21
Stamped by 10
Boxed by 15
Bundled by
Inspectors No. 27

Final Inspection.

No. Dozen Inspected 10
Single Knee
Menders 2
Seconds none
Repair "
Repress "

Pairer's Coupon.

Lot No. 1 Date Mar 12 1902
Style No. a Name 45
Color Black
Size 9 No. Doz. 45

Pd. on	M	Bd.	Repress	Redye	Odd.
42-8	1-10	-10	-6	-3	-3

Stamper's Coupon.

Lot No. 1 Date Mar 12 1902
Style No. a Name 10
Color Black
Size 9 No. Doz. 42-8

Boxer's Coupon.

Lot No. 1 Date Mar 12 1902
Style No. a Name 15
Color Black
Size 9 Doz. 42 ½ Doz.

FIG. 3.

as shown in Fig. 2; the ticket inserted in the cut made by the saw; this prevents tickets being spattered with dyestuff.

After being "tommed" the ticket holder containing the tickets is put on the lot, which is then ready for the oxydizing cages. When the goods are entered, the ticket holder with ticket is hung on the cage containing the goods. The ticket then follows the goods to the aging room, and so on until the lot is ready for boarding, when the ticket is taken from the case and sent with the lot to the boarder. it for a memorandum, by which she is paid.

Each operative is known by her respective number, and the coupon is filled out and detached as follows

After the goods are boarded, the boarder presents ticket, Fig. 1, with the lot boarded to the foreman, who gives him credit for same. The foreman then fills out the first part of the ticket, Fig. 3, as shown and gives the lot to the presser. After the goods are pressed, the presser's name or number is put on the ticket, the lot and quantity being entered to the credit

of the presser on a book kept by the foreman.

The lot with the ticket attached then goes to the pairer, who inspects and pairs the same, then fills out pairer's coupon, detaches it, at the same time putting her name or number in place on the main ticket, as designated by the words "Paired by," Fig. 3.

The goods are then examined by the inspector, who picks out several dozen from different parts of the lot for this purpose, and after inspecting, marks results of such inspection on the main ticket, Fig. 3, under "Final Inspection."

The goods are now given to the stamper, who stamps them and fills out and detaches stamper's coupon, after putting her name or number in place on the main ticket.

The lot then passes to the boxer, who boxes them and fills out and detaches her coupon after putting her name or number on the main ticket. The boxer's coupon being the last, the main ticket is retained with the lot for future reference. By filing the finishing ticket and having the boxer's stamp on the bottom of each box giving the date and number of lot, which can be done very quickly with a rubber stamp, any complaints from purchasers of the goods can be readily traced to the parties responsible for the same. This will be found very convenient, as carelessness on the part of the help may be easily detected and the evil remedied.

Opposite M (meaning mender) 1-10 means 1 dozen and 10 stockings. Md. means mended, that is, they were mended before going to the dyehouse.

FOREMAN.

Cuffs on Men's Union Suits.

In the Question and Answer Department of this issue will be found a question from "Union" No. 229, asking the best way of securing a cuff at the ankle and wrist of a line on men's union suits and have them retain their elasticity. We have submitted it to several practical men, and have received the following replies:

Editor Textile World:

Referring to the question in regard to cuffs on men's union suits, I enclose a sample showing one way of putting on cuffs on ribbed goods. The cuff is first sewed to the goods with an Overlock machine; this stitch is preferred on account of the elastic stitch. After the cuff is sewed on, it is covered with a Union Special five thread machine, and when the thread used is the same shade as the garment and cuff, it makes a very neat job and also a very serviceable one.

BADGER.

Editor Textile World:

Referring to your question in regard to cuffs on men's union suits, the neatest way to do it is to loop them on; this can be done by cutting the ravel end of the goods at the ankle end of suit or sleeve; the objection to this, is the waste in having to cut the sleeve all one way of the cloth and not interlock them; but it can be done and done nicely, only great care must be taken in the cutting room to always cut and mark the end of the garment, that can be raveled back. Then loop just the same as flat goods, but care must be taken not to stitch the cloth more on one side than the other, so that when cut the cloth will not ravel back crooked. TOGA.

Editor Textile World:

In regard to the question of securing a cuff at the ankle and wrist of a line of men's union suits knit on latch needle machines, and have them retain their elasticity, the common practice here is to fasten cuffs by means of what is called a welting machine; this method is very unsatisfactory as a tight place is formed at the joint, which, on breaking, easily becomes detached. An English firm builds a machine for this purpose, which is called a rib linking machine, and is

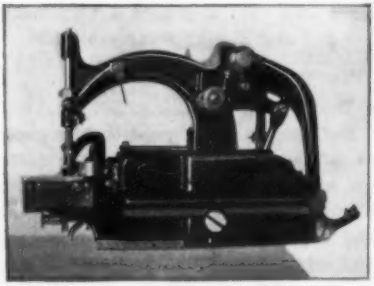
designed for the purpose of making a neat joint which is also elastic, giving the goods a very nice appearance.

ENGLISH FOREMAN.

A New Overedge Sewing Machine.

If our American manufacturers of knit goods and hosiery do not get perfect machinery, it will not be through lack of efforts on the part of inventors and machine builders to meet their needs.

Among the latest suitors for their favor are the new "Overedge" sewing



THE ARNOLD OVEREDGE SEWING MACHINE.

machines, now being put on the market by the Arnold Sewing Machine Company of Newark. Mr. Arnold, of the Newark company, was, we are informed, the original inventor of the overedge stitch, applied to the cut edges of knit fabrics, and for seventeen years he controlled the invention, until the expiration of his patent in 1887 for overedge stitching on knit goods.

The Arnold overedge welting machine and the Arnold overedge seaming machine are the result of aiming to improve upon all previous machines for their line of work. After the expiration of certain patents for trimming devices in 1899, the Arnold Sewing Machine Company began the work of constructing a rapid overseaming machine combined with a trimmer. Realizing the importance of having a simple machine, much time and care were expended to get a single-acting looper. Mr. Arnold conceived the idea of making a "somersault" looper, with a movable axis, and thus secured a simple, single-acting looper, moving in one pathway, co-operating with the needle below the needle plate and also above the needle plate. This form of construction was the basis for the simplicity of the present machine.

The old style "goose-neck" arm is used with the needle arm, driving the needle bar, and with short, straight needles. It is claimed that they are the only straight needle overedge machines on the market. This adds to their popularity. The frames are made very stiff, bearing surfaces large with self-oiling devices, and so arranged that by the removal of the cover all parts of the machine are readily accessible. All the bearings are hardened and ground, while light in weight and form, and the adjustments are few and simple. The Arnold Company claim for their machines simplicity, durability, rapidity and accessibility. Although on the market but a short time, we are informed that the machines have already been adopted by some of the largest knit goods manufacturers in the country.

Fashioning of Hosiery.

Shaped hosiery should be as near as possible suited to the form of the foot and leg, and with knit fabrics a less number of seams are required to produce a covering, which adapts itself to the form of the foot and leg, and avoids a side strain on the skin. The elasticity of the knitted threads allows the fabric to adapt itself to the change in the form of the foot while in action. These qualities are not possessed by any other fabric. It does not follow, however, that the cylindrical form is perfectly suited for well fitting hosiery; it is necessary to fashion the hose more or less, in order to adapt it to the form of the toe and heel.

The manner in which hosiery is at

present fashioned, leaves some things to be desired. For instance, nowhere is any widening made for the ankle, but at this point the elasticity of the goods are relied on for the fit; then, again, the point of the toe is seldom shaped to conform with the one-sided slant of the toes. Fig. 1 shows a form of hose suited to the natural shape of the foot; hosiery is sometimes made in this way, but generally the toe of the stocking is narrowed on both sides to 40 per cent. or even 35 per cent. of the original width, both in machine fashioned hosiery and cut goods (see Fig. 2). The toe is seldom narrowed to the point A, as indicated by the dotted lines. The so-called French toe is formed as shown at B, Fig. 2.

FIG. 1. FIG. 2. FIG. 3. FIG. 4.

Three different forms of the foot are made on flat frames as follows:—The English foot, with both sole and upper part made of one piece sewed at the side; the German foot made from one piece, having two or three points at the toe with seams either at the side or on the sole; the French foot made from one piece, with but one point at the toe, and the seam underneath on the sole. Frequently the toe, instead of being formed by a straight slant, is curved, as shown at a, b, c, Fig. 1. The toe is narrowed gradually from a to b, at the latter part more rapidly, until the point, c, is reached. No change is made to suit the middle part of the foot; it is cylindrical in form, and the stocking at this point adapts itself to the foot.

Fashioning the heel offers various difficulties, and several methods are adopted according to the views of the knitter. With flat or cut goods, the heel is formed as shown at Fig. 3, by the simple extension of each side, ff, of the stocking, L; these two sides are then joined by a seam as shown at n, Fig. 4. A special shape for the heel is not employed, but the corner is somewhat rounded as shown at e, Fig. 4. The two points, ff, are then joined under the heel, n', Fig. 4, and the heel of the foot itself is then left to make this part of the hose fit.—Deutsche Wirker Zeitung.

—Reports from Germany indicate that the strike of the textile workers has assumed more serious proportions, resulting in a complete tie-up of the mills in some localities. In Greiz, Fuerstenthum Reuss, one of the textile centres, the government has made vain efforts at arbitration, and no further intercession on its part is expected in the near future. The woolen, cotton goods, knitting and dyeing industries are almost at a standstill, the manufacturers having been forced to cancel large contracts. Many of the weavers are employed in small shops under a system quite different from that in America. Their salaries are among the lowest paid to skilled labor in Western Europe. In recent years, however, larger factories have been growing up, bringing with them material increases in the wages of the men.

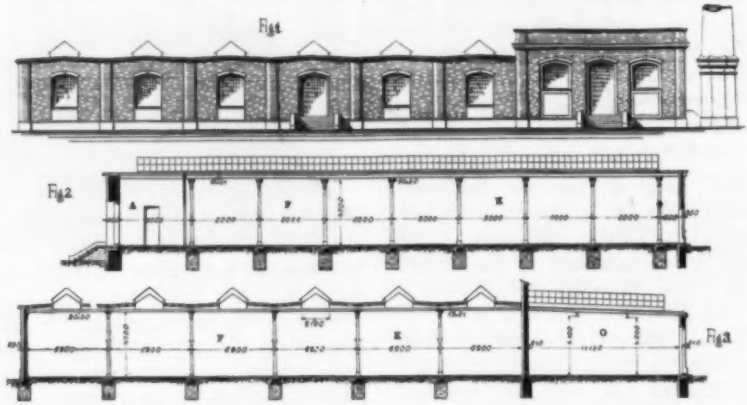
—The happiness of one to whom we have rendered a service, is the best reward we can receive.—Countess Diane.

SILK DEPARTMENT.

Plan of a Small Silk Weaving Mill.

We show in the accompanying diagrams, the ground and elevation plans of a small silk weaving mill recently built in Germany. The building is divided into two parts: First, the weave room itself, which is nearly square; and second, a rectangular building covered with a monitor roof and used for the power plant and the dining room for the operatives.

The weave room is built so as to be readily enlarged from two sides if desired. To facilitate such an enlargement, supporting columns are built in pier walls and between them is a light wall which can be easily removed. A glance at Fig. 4 will show this provision for future enlargement.



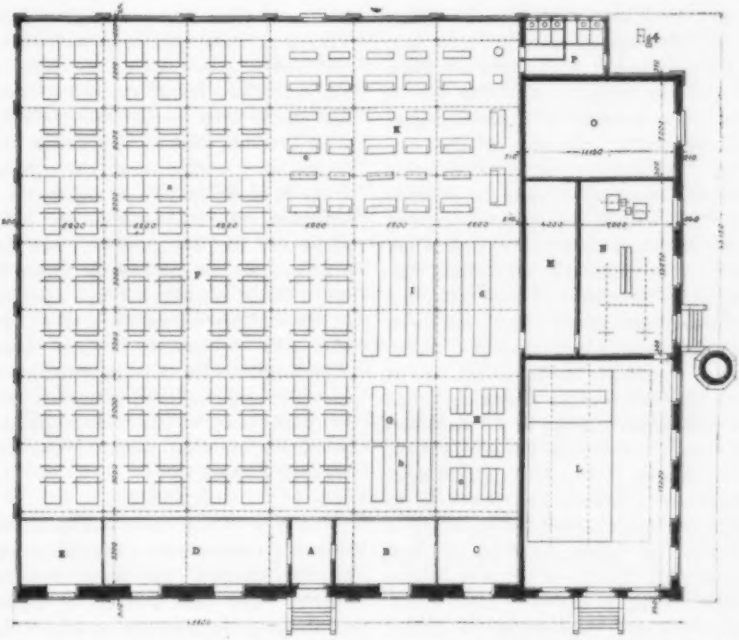
The entrance to the weave room is reached by a flight of five steps, as shown in the plan. The hallway, A, leads to a partition, which runs the whole width of the weave room. Cross partitions on either side of the hallway divide the space into four (4) rooms, B, C, E and D. B is used for the office; C is the storage and stock distributing room, in which the filling yarn is kept; E is for the rubbing machines, which are used to remove reed marks from the goods. These marks are very liable to occur in cloth woven with a satin weave. D is the shipping room. In the main weave room are the winding, spooling and warping machines, as well as the looms.

The processes are carried on in the following order: The silk is delivered from the storage room to the winders or warp spoolers, d, in the room, I. Here are five (5) winders, each having 60 spindles. The warpers are in the space, K; these warpers vary in width to correspond with the two widths of looms. The capacity of the warpers is in excess of the requirement of the looms, and this affords an opportunity for making warps for weaving in the houses throughout the neighborhood. The two (2) beaming machines are located at the side of this room, K, and near them are the hand warpers for making sample warps.

The warps are next taken to the looms, from which the cloth is carried to the room, D. In the space, G, are located the filling winders; at H are placed the twisters. The space occupied by the rooms so far mentioned is 136 feet long and 122 feet wide, giving 1523 square feet; this is equal to 15¼ square feet for each of the 100 looms installed. The looms are so arranged that one (1) 30 inches wide alternates

with one (1) 20 inches wide, and all are driven by electric power.

The adjoining building contains the boiler house, L, having one boiler connected with a chimney 98 feet high; the machine shop, N; the repair shop, M; dining room, O, and toilet room, P. The dining room is 36 feet long by 23 feet wide, and affords ample space for about 100 operatives. It is accessible only from the outside, as shown in the diagram.



From the shafting in the room, N, are driven the machines and dynamos from which the current is carried to the motors at the looms and other machines throughout the mill.

As shown at Fig. 3, skylights are inserted in the roof, one in each bay; these lights extend in the same direction as the rows of looms, and effect an excellent distribution of the light.

Fig. 1 is an elevation plan; Figs. 2 and 3 are cross sections; Fig. 4, the ground plan of the mill.—Uhland's Technische Rundschau.

—With many it is the name alone that is worth anything.—La Bruyere.

Hints on Silk Manufacturing.

The qualities of no other textile materials are so difficult to accurately judge as those of silk. Wool and cotton, on account of their coarser structure, are much more readily examined than is the fine silk thread. Good silk should possess lustre, softness, cleanliness, uniform twist, strength and elasticity, and should yield but a small percentage of waste in manufacturing. A sample skein is taken from a bale and placed upon two polished rods. The binding threads are then removed, and while one person holds one rod, another takes the second rod and opens up the silk by sudden jerks on the skein. This spreads the silk uniformly over the rods, which are then placed somewhat nearer together to let the skein hang down; in this position the condition of the silk can be easily observed, especially if it is held between the observer and a good light.

East India silk is the most difficult to judge, as its qualities are revealed only after boiling off and dyeing. Sev-

eral samples should be tested from each bale; it is very unsafe to buy silk from the small samples shown by the dealers. Fully as important as the examination on the rods, is the determination of the twist, elasticity and strength. In spite of the greatest care, defects in the raw silk are very easily overlooked; for this reason from 10 to 20 lbs. of the silk under consideration should, if possible, be manufactured into cloth. While such tests entail expense, yet it will be found much better to make them than to run the risk of using inferior silk.

Buyers are apt to overlook the question of the twist in silk, and yet on this point depends to a great degree the successful working of the material. The secret of good weaving with the best Italian material depends principally upon the proper degree of twist, which is from 13 to 14 turns per inch. It is important that Milan silk should be uniform and free from impurities; this grade there has been used as fine as 9 to 10 deniers. Objection is frequently raised to the use of such fine numbers on the ground that the difficulties arising in its manufacture more than off-set the advantages. Nevertheless, it is a fact that, if first-class silk is bought and delivered to skilful winders, a decided economy is effected by using fine yarn. Ten denier silk produces a very cheap fabric, owing to the very small quantity of material required for the warp. As the thread is very fine a good cover cannot be obtained with a coarse layout; for this reason, the fine numbers are used chiefly for fancy goods, in which the cover or face is not so essential as in plain cloth.

Scarcely any difference can be detected between the face of fancy cloth made with 10 denier, and a fabric made with 12 denier silk, while with the finer yarn there is a saving of 20 per cent. It is here taken for granted that a satin weave, not a taffeta or grain weave is used. Such fine silk is not strong enough for taffeta or grain weaves, and must in such cases be warped double and woven with coarse reeds.

During recent years Canton grege has been used in large quantities; the results have not been entirely favorable. This material can be worked to good advantage on power looms only by the use of coarse reeds and loose weaves; even the best qualities are very harsh, and much difficulty is found in weaving this grade in fine numbers.

For a good quality of satin, a fine grege set close gives the best results. Very fine reeds have been used during late years, some having as many as 157 dents per inch. Instead of making piece dyed satins, as formerly, with fourfold twist, the practice now is to use twofold silk. If Canton grege is used, but 3/4 of the length is obtained that is produced by Milan grege and the lower price of the Asiatic product is more than offset by the inferior working of the material. If strength is especially desired, the best silk to use is French grege (Cevennes); with this material heavy jacquard fabrics can be woven, and the high price is more than compensated for by good work in the mill. —Textil-Zeitung.

—A new conditioning house of the Roubaix Chamber of Commerce, just opened, contains the latest improvements. The old system of hot-air ovens at a temperature of 120 to 130 degrees has been abandoned for ovens heated by steam coils, at a temperature of 110 degrees. It is claimed that the drying of the wool is perfectly even under this new system, there being no difference of temperature in any part of the apparatus. The United States consul at Roubaix states that, in the new conditioning house, there are 6 groups of 8 ovens each—that is, 48 drying machines—and the room is sufficiently large to accommodate 78. There are also preparatory ovens, heated by steam pipes, in which the wool receives a preliminary drying.

POWER DEPARTMENT

Testing Steam Engines.

Accurately indicating engines is not alone sufficient. It is just as important that the diagrams should be accurately calculated when taken, for, if this be done inaccurately, the power registered is either over-stated or understated, which in either case is misleading.

Indicator diagrams can be accurately, calculated by dividing them into 10 equal parts, and measuring each part separately. To do this, however, requires both patience and care—more care, indeed, as a rule, than the average engineer is willing to give; and the writer's experience, extending over a number of years of checking such calculations, is that in the majority of cases the power calculated from the diagrams is over-stated.

At all mills there should be a check on the engineers' calculations; and if mill-owners would only invest in a planimeter, or other instrument used for calculating indicator diagrams, a check could be kept on the engineer, by any intelligent clerk. The instrument would then very soon pay for itself, for mill-owners are very generally led to believe that the horse-power developed by their engines (as reported by the engineer) is more than it is in actual fact.

It is a well-known fact that the engineer who can show that his engines are developing one horse-power for (say) 2 lb. of coal per hour, is much better thought of than the man whose engines take 2¼ lb. to do the same amount of work; hence the tendency to make the power as much as possible, which prevails to a far greater extent than most people have any idea of.

Moreover, some engine makers err as much in this direction as do the men who look after the engines. Hence the necessity for this check, which is so easily applied. For example, if only 1 lb. be added at each division of the diagram, it means an addition of 1 lb. of mean pressure on each diagram, or a mean pressure of 2 lb. per cylinder.

This, with cylinders where 1 lb. pressure is equal to 50 or 60 H. P., signifies something considerable, and the coal consumed reckoned on this basis shows a smaller quantity per horse-power than has actually been used provided the diagrams had been accurately calculated.

Another matter that is frequently overlooked is the necessity for periodically testing indicator springs, which gradually get lighter or weaker (this being more marked in single-coil springs than double-coil springs): consequently they show a larger diagram than they ought to do, which is another way of making the power appear more than it really is.

It is well known by many engineers that their springs are weak, yet they never complain of the spring, if their employer does not; and he either knows nothing about it, or never thinks about it, and if he does think about it, seldom deems it worth while troubling over. Consequently there need be no hesitation in stating that in Lancashire alone more than 50 per cent. of the indicator springs at present in use would be found too light or weak, if they were accurately tested.

Many mill engines are both credited with driving a considerably greater load than they are actually doing and with being more economical engines than they are, simply because the indicator springs register 1 or 2 lb. more pressure than they should do, on account of being too light or weak. Accordingly the question arises—Is it not worth the small expense that would be incurred in having them tested?

It will be readily admitted that the slightest reduction in the thickness of

the wire of which the spring is made, renders it weaker than it should be, and this reduction takes place from several causes without any notice being taken of it.

Again, many indicator springs are inaccurate owing to the method of manufacture; they never get heavier, but gradually and surely get weaker and weaker. The writer has, indeed, often tested indicator springs which had been in use a short time, and found them 2 or 3 lb. too light.

In some mills there are indicator springs that have been in use for 10, 15, and even 20 years, and have never been tested during the whole of that time, and it may easily be imagined what condition some of these must be in at the present day.

A careful inspection of these springs would reveal their condition; but nine out of ten engineers never suggest a test, for the simple reason that a light spring favors them more than an accurate one would do; consequently everyone goes on using such a spring, and never suggests to his employer or manager the advisability of having it tested.

The condition of some indicators now in use would also be a surprise to mill-owners, if they called in an experienced and competent man to examine same, and point out the defects. If the manager were shown the difference in the diagrams produced from his engines by a really good indicator having correct springs, he would be astonished at what his engines were really developing, when compared with what he has been led to believe they had been doing.

It would well repay every mill-owner to get the best instrument that can be purchased, one that can always be relied upon, and one in which the springs are guaranteed to be reliable and accurate, as the difference in price between an unreliable indicator and one of the best obtainable is only at the most $10. A correct record of the engine's performance could then be had whenever required, and the owner would know for a certainty what power was actually being developed, provided means were taken for checking the calculations of the diagrams afterwards.

If the indication of engines is worth anything, it is worth doing well, and a firm should not be satisfied with the slip-shod manner in which the work is usually performed, and the careless way in which the diagrams are afterwards calculated, as it simply rests with themselves to have these things remedied.—Textile Mercury.

Removing Boiler Scale with Petroleum.

For several years petroleum has been used extensively in Germany to remove scale from steam boilers. The oil was introduced with the feed water. When the water was drawn from the boilers, the oil, floating on the top, would be deposited on the scale and dissolve it. There was no thought of danger in connection with the operation, but in a recent report issued by the government, attention is called to several accidents that have resulted from this method of boiler cleaning. Referring to one case, it says: "Two workmen in a jute spinning mill at Waldhof desired to examine a leaky manhole in the boiler. While in the act, the gases arising from the petroleum inside the boiler ignited; a flame rushed through the manhole and burned the two workmen so severely that one of them died soon after."

Soft Metal Hammers.

The accompanying illustrations show a device for moulding hammers made from soft metal and used for adjusting parts of machinery, which hard hammers would damage. Brass, bronze and hard wood are frequently used for this purpose, but without some means of remodeling soft metal hammers, it is necessary to cast them to one side when they become deformed

by usage.

Fig. 1 represents the open mould, in which has been placed the handle of the hammer previous to casting the metal on it. The mould is then closed and the covering fastened by a ring and screw. The soft metal is then

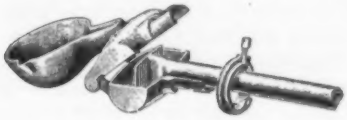


FIG. 1

FIG. 2

FIG. 3

FIG. 4

placed in the bowl attached to the mould, and melted over a furnace, as shown at Fig. 2. By tipping the bowl slightly, the melted metal runs into the mould and forms the head of the hammer. When cool, the mould is opened and the hammer taken out ready for use.

Fig. 3 shows the hammer with the head jammed by use, and Fig. 4 with the head newly cast. One advantage of this device is, that there is no danger of the handle slipping from the hammer, and also, that a hammer found out of shape can be quickly made as good as new.

Hammers of soft metal are very useful in mill work, and with such a device as the one described, will doubtless be more extensively used than they are.—Le Revue Technique.

Lubricating Oils.

BY J. F. LIEBERMAN.

In the study of physics one can readily understand the necessity of the artificial lubricant known as oil. But regarding the scientific laws regulating perfect lubrication, little has been known except in very recent years.

Lubricating oils are, as regards origin, divided into two general classes, viz:—Mineral oils; fatty oils. The latter is the general name applied to vegetable and animal oils.

Mineral oils originate from petroleum industry, and are obtained by distillation, and on the carefulness exercised in the distilling depends the essentials of this lubricant.

The lubricating oils are obtained by eliminating the paraffin, and their specific gravity is from .82 upwards.

Now to consider the fatty oils:—Animal oils are contained in cells of membranous tissue, and must be extracted shortly after the killing of the animal, otherwise the tissue putrifies and fat becomes rancid and emits bad odor, as can be noticed in the vicinity of slaughter shops.

There are two classes of animal oils viz: Marine animal oils, comprising whale oil, porpoise oil, codfish oil. Terrestial animal oils, such as extracted from the feet of cattle, horses, sheep; lard, tallow. Vegetable oils have three divisions, viz: (1) Drying oils, such as linseed, hemp oil, etc., but they are not much used as lubricants. (2) Semi-Drying oils, such as cottonseed, corn oil, rapeseed, castor oil. Rape oil is very viscid and is used

as standard to test viscosity of oils. Castor oil has greatest viscosity and is largely used to lubricate heavy machinery. By blowing air through hot cotton, linseed or rape oil, a thick viscous oil of high specific gravity is produced. This oil is called "blown oil," and which, when mixed with mineral lubricating oils is used as a substitute for castor oil for heavy machinery. (3) The non-drying oils. They absorb very little oxygen. The chief oil of this class is named "Olive Oil," but this oil forms free acid when exposed to air or heat.

Having arranged the classes and varieties of oils we now turn to the essentials, when purchasing lubricating oils, to be kept in mind: (1) Safety; (2) Body; (3) Chemical action on metals; (4) Durability; (5) Freezing point; (6) Cost.

The safety point, or flash point of an oil is the temperature at which oil gives off sufficient vapor to form a momentary flash when flame is brought near its surface. No oil is safe to use whose flash is below 350 deg. F.

The fire test is temperature at which oil gives off enough vapor to maintain a continuous flame if ignited, and is usually 20 deg. F. higher than the flash point. Both the flash and burning points are lower than the boiling point.

A very important fact is that certain animal and vegetable oils, when soaked up in waste, will take fire on standing. This is especially true of linseed, cottonseed, corn, lard and neatsfoot oils, and is caused by the rise in temperature due to oxidation of the oil. If from 40 to 50 per cent. of mineral oil be added to these oils, this spontaneous combustion is prevented to a great extent. This is one of the uses of neutral oils.

The 925 deg. hydro carbon oil would be very suitable for lubricating the journals of fly wheel shafts but most unsuitable for spindles, which would be more suitably lubricated by the 860 deg. oil.

In determining the oil to use for a certain purpose, consideration of the following points will be of use: 1. Weight of the bearing; 2. The actual surface upon which the weight is distributed; 3. The speed; 4. The temperature at which the oil has to work; 5. Whether the bearing is in proportion to the work passing through it.

The heavier the weight, the higher the temperature, or the smaller the bearing surface in proportion to the work passing through, the heavier is the body of oil required; whilst the smaller the weight, the higher the speed, the lower the temperature, the larger the bearing surface compared to work, the lighter is the body of oil required. Badly worn bearings need a heavier bodied oil than same bearings in good repair.

The third point, the chemical action of oils on metals, is one of the most important to be considered.

All animal and vegetable oils contain acid to a greater or less degree. This acidity may be due to the materials from which oil is extracted, from process of refining, from chemical action through age, from heat of atmosphere, or from friction of bearing. This acidity causes undue wear and tear and affects different metals in various ways:

Brass is not affected by rape oil and is most affected by olive oil, while mineral lubricating oil has least effect on brass and most on lead; sperm oil acts least on brass and most on zinc.

Iron is most affected by tallow oil. Lead is most affected by whale, lard and sperm oils.

Mr. I. J. Redwood, who has made exhaustive experiments upon action of different oils upon metals says that "mineral lubricating oil has, on the whole, the least action on the metals experimented with, and sperm the most." The metals experimented with included iron, brass, tin, lead, zinc and copper.

Thus we see that the two oils, which until recent years, were most used, are the worst that could be

used for wear and tear, as the animal oil had most effect on iron, while olive oil destroyed the brasses. The so-called "gumming" is really due to the action of the free acids on the metal bearing and not to the oxidation of oils, as was formerly thought.

Liquid oils corrode metals very evenly, so that the effect is not readily observed. Mineral hydro carbon oils contain no acid, unless they have been carelessly refined.

(To be continued.)

Protection of Chimneys.

The necessity of protecting chimneys against lightning recently received an illustration in Hanover, Germany, that may well be called striking. During a thunder storm the lightning struck two tall chimneys. One of them, over 195 feet in height, was the highest in the neighborhood. It had been built but six months before and was coated with tar. Sufficient time had not elapsed for the mortar to dry out, and, consequently, the iron ladder on the outside, together with the wet mortar, formed a good conductor for the electricity. The inner wall of the chimney was thoroughly saturated with acid from the dye works, for which the chimney was used. The chimney was located near a river, and the soil around it was very damp, so that all the conditions were favorable for the easy passage of the electric current.

The electricity was attracted by the lightning rods and by an electric power station in the immediate neighborhood. The upper 120 feet of this chimney were completely shattered, and below this cracks extended to within 16 feet of the ground. The iron hoops around the chimney, together with large pieces of the masonry, were scattered in every direction. The explosive force exhibited was attributed to the generation of steam or explosive gases in the damp masonry.

The other chimney that was struck was 136 feet in height. Two smaller chimneys stood near it. It had been built about twenty years, and cracks had appeared during this time through which the moisture had penetrated, so that the masonry of this chimney, although much older, was saturated with water like the first, and formed a good conductor for the electricity. This second chimney was damaged only in the upper part, the current having apparently jumped to the telephone wires and a workman house near by. One peculiarity was that both these chimneys were affected to a greater extent on the north, or weather side.

Memoirs of a Veteran Master Mechanic.

EBEN GOULD.

(Continued from March.)

"Where is K——?" I asked.

"I don't know."

I tried the water cocks, and could not get a drop of water even from the lower cock. I then ordered the fires drawn; I did not dare put on the pumps, not knowing where the water was. Next I rushed to the office, found the agent and super both in, told them what had happened, and that I could not find K——; I then went back and helped the fireman draw the fires.

The agent came down and had a talk with the fireman, and found that K—— had left for Providence on the 8 a. m. boat in the morning. It was fortunate that I did not start the pumps, for when the boiler had cooled down enough to start pumping, it took twenty minutes to get the water up to the first gauge cock.

Nothing was seen or heard of K—— for over two weeks. After he had been gone several days, I noticed that the steam gauge showed a pretty high pressure, and then it occurred to me that I had never heard the steam blowing off through the safety valve.

The boiler room was quite high and a man could stand up between the boiler and the ceiling. This space above the boiler was cased up making a dark hole. Out of curiosity I got a light, went up a ladder to the door and entered this room above the boiler. I soon discovered the safety valve, and in addition to the usual weights on the lever, there was hung a mass of old iron, consisting of pieces of broken machine castings, fastened together with wire. The mystery as to why I had not heard the steam blowing through the safety valve was explained. I reported this at once to the agent and super and they both came down to have a look at it. Mr. Gardiner at once sent word to the Corliss Works, and a man named Thompson was sent down to look the boiler over. That night we let the steam down and took off all the weights and had them weighed. Mr. Thompson figured out that it would have taken a steam pressure of 300 pounds per square inch to start the valves. Thompson taught me how to adjust the weights and safety valve, and many other things about steam engines and boilers.

During the last years of my work in Holbrook's lower village they built a shingle mill. It was a crude affair, composed of a wheel about 8 or 9 feet in diameter and 6 inches high, made of boards placed crossways, bolted and pinned together. It was made fast to a shaft by large collars belted to each side of the wheel and keyed to the shaft with a pulley to be driven by a belt.

On this wheel were bolted two large knives or cutters, one with the outside end set out for the butt or thick end of the shingles, the other set for the thin end. The wheel had throats cut through the back of the knives so that as the shingles were cut from the block, they would pass through the throat and fall to the room below.

The shingles were made from chestnut logs; the logs were first split into two parts in the sawmill, and then cut into blocks the length of the shingle; they were then put into a steam room and steamed until soft to avoid checking while being cut. When steamed enough, the blocks were placed on a platform against the face of the cutting wheel and pushed against the face of the wheel, the knives splitting off the shingles.

It took two hands to cut a batch of thirty thousand. Several of the men that had fed the blocks got the ends of their fingers cut, and were afraid of the machine, and no one could be found to do the work.

About this time I had left off work to get a few weeks' schooling. One morning, upon going into the store in the upper village, I met Mr. Holbrook, who asked me what I was doing? I told him I was going to school.

"Where did you work last?" he asked.

"Toadville," I replied without thinking.

Now there was nothing that would make Mr. Holbrook so angry, as to mention "Toadville." He was ripping mad, and taking a whip declared he would thrash me if I ever went there again. Mr. Holbrook was a pretty good man and always kind to the boys of the village, but he could not bear to have one of his villages named "Toadville."

At this time there was a batch of shingles waiting to be cut, but no one would tend the machine. Several days after this I said to father:

"I am going down today to cut that lot of shingles, so get the steam on and I will be there in time to get the machine started."

Father knew nothing about the Toadville affair between Mr. Holbrook and me. I went down, but in place of my fingers, I took a large awl to push the blocks into the machine, and I neither cut the awl nor my fingers. That night as my father was coming from work, he met Mr. Holbrook on the street. Mr. Holbrook asked him

if he had found anyone to cut the shingles. Father said:

"The shingles are all cut."

"Who did it?" asked Mr. Holbrook.

My father, seeing me but a few feet away, said, pointing to me:

"That boy."

That ended the row, and Mr. Sylvanus Holbrook always treated me kindly from that time on. My father was at that time superintendent of the works at the lower village.

Soon after starting on my work at the Perry Mills, in Newport, R. I., I found that some of the gearing on the spinning machines were badly worn, and that new ones were needed. The gears that were the most worn were each about 8 inches in diameter and had 64 teeth. Previous to this, they had been repaired once by taking the old gear, turning off the teeth and shrinking a wrought iron band on the blank, turning off and cutting new teeth on the band, thus making a good wrought gear. As I had worked nearly a year at cutting gears while in Woonsocket, and there was a gear cutter at this mill, everything went all right with the gear repairing until noontime. When I came in from dinner, I noticed that some one had moved the wrench from where it lay when I went out. The gear at that time was cut half way around, but I soon discovered that the index had been moved into the next row of holes, which would be right for cutting 65 teeth instead of 64, which would have spoiled the work. I shifted it back to the right place, and as no one was in the room at that time, I left the gear cutter and went to do some oher work.

After the other hands came in, I started up the cutter. I noticed that one of the men kept a pretty close watch on me, and as I cut the last tooth, I stopped the machine, took the key and lead and began as if in a hurry to get the gear off the cutter. Then this man came hurrying up and looked at the gear, his face as red as a beet.

"How is that?" I asked.

He replied:

"The man that used to work here would sometimes have the gears slip on the arbor and make a thick tooth or a thin one when it came round."

"Oh!" I said, "it is only greenhorns that do that; not anyone that is used to the work."

Well, he never knew why that gear was not spoiled. If he had left the wrench lying where I left it, he would have caught me sure enough. Several capers of a similar kind were attempted, such as loosening the screws to the back rest of the turning lathe while I was out, but never once did I get caught.

In 1853, I left Newport, and went to the Blackstone Cotton Mill, under Mr. John Fay, where I worked in the machine shop and also in the boiler room when the mills were heated in the winter time. I left Blackstone in 1855, and went to Rockville, Conn., where I worked a short time for a Mr. White, the inventor of the Government envelope machine, which he was perfecting at that time, and on which I worked until the November of that year, when I was called back to Northbridge, Mass., on account of a severe accident to one of my children.

I did not go to work again until 1856, when I went to what was then called the Maverick Woolen Mills, Thomas Barrows, Agent; the mills were owned at that time by Messrs. Edmonds & Colby. I found Mr. Barrows to be a pretty good man to work for, taking him by himself, but he was badly hampered by having a lot of relations and others at work in all parts of the mill, brothers-in-law, nephews, cousins, all seemed to be depending on him for their living, so that if a stranger came to work among them, he had to run the relative gauntlet, and in most cases was made to feel that he must do about what the relatives wished or they would make it hot for him with the "old man," as they called Mr. Barrows.

(To be continued.)

DYEING DEPARTMENT

Dye Recipes for April.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16 page pamphlet, in convenient form for preservation. Subscription price for the TEXTILE WORLD with the Dyers' Supplement is $4.

Recipe No. 49.

Black on Cotton Yarn.

Melanogen G on 100 lbs. cotton yarn.

Prepare the dye bath with

16 lbs. Melanogen G.

(Victor Koechl & Co., 122 Hudson St., New York.)

2 lbs. Sodium Carbonate.

50 lbs. Common Salt.

Enter at 176° to 194° F. and dye at this temperature one hour.

After-treat 20 to 30 minutes in a bath containing

3 lbs. Zinc Sulphate.

1½ lbs. Copper Sulphate.

at a temperature of 120° to 140° F.

Melanogen G, although a regular sulphur color, may be dyed without the use of Sodium Sulphide and in ordinary dyeing apparatus.

Melanogen G produces deep blue blacks on loose material, cops, yarns and warps. It is of low cost, simple application and possesses great fastness to washing and light. Copper apparatus should be avoided.

Recipe No. 50.

Yellow on Cotton Yarn.

Diamine Yellow C P on 100 lbs. cotton yarn.

Prepare the dye bath with

3 lbs. Diamine Yellow C P.

(Cassella Color Co., Ltd., 182 Front St., N. Y.)

20 lbs. Glauber's Salt.

Enter at 170° F., bring to a boil and dye at this temperature for one hour.

Diamine Yellow C P produces a brilliant shade of yellow possessing all the characteristic properties of the direct cotton colors.

Recipe No. 51.

Magenta Red on Worsted Yarn.

Acid Magenta O on 100 lbs. of worsted yarn.

Prepare the dye bath with

3 lbs. Acid Magenta O

(Schoellkopf, Hartford & Hanna Co., 100 William St., New York.)

15 lbs. Glauber's Salt.

4 lbs. Sulphuric Acid.

Enter at 170° F., bring to a boil and dye at a boiling temperature for about one hour, exhausting the bath if possible.

Acid Magenta O produces a brilliant and pure shade of magenta red.

Recipe No. 52.

Black on Cotton Yarn.

Immedial Black N R on 100 lbs. of cotton yarn.

Prepare the dye bath with

25 lbs. Immedial Black N R (for starting kettle.)

(Cassella Color Co., Ltd., 182 Front St., N. Y.)

10 lbs. Soda Ash.

10 lbs. Sodium Sulphide.

80 lbs. Common Salt.

Enter the yarn at 170° F., bring to a boil and dye at this temperature for 3/4 of an hour, keeping the yarn under the surface of the dye liquor.

Full directions for accomplishing this may be found in Cassella Color Co.'s publication on Immedial Black and Immedial Blue.

When dyeing is completed the yarn is after-treated for one-half hour at 170° F., in a bath made up with

3 lbs. Potassium Dichromate.

3 lbs. Acetic Acid.

Immedial Black N R will be found

an excellent black and its fastness to washing, light, milling and acids is remarkable.

Recipe No. 53.

Green on Worsted Yarn.

Acid Green Extra Conc. on 100 lbs. of worsted yarn.

Prepare the dye bath with

2 lbs. Acid Green Extra Conc.
(New York & Boston Dyewood Co., 55 Beekman St., New York.)

20 lbs. Glauber's Salt.

3 lbs. Sulphuric Acid.

Enter the goods just below the boil and dye at a boil in the usual manner for about one hour, exhausting the dye bath if possible.

Acid Green Extra Concentrated is an acid color, producing an exceedingly pure and brilliant shade of green.

Recipe No. 54.

Maroon on Cotton Yarn.

Maroon A on 100 lbs. cotton yarn.

First mordant the yarn with tannin as follows: Enter in a bath containing 4 to 6 lbs. of tannin or an equivalent of sumac extract at 140° F., turn for twenty minutes at this temperature, then sink in the cooling bath for twelve hours or over night.

Lift, wring without washing and work for twenty minutes in a cold bath containing

2 lbs. Antimony Salt.

Wash thoroughly and dye in a bath containing

2 lbs. Maroon A.
(Read, Holliday & Sons, Ltd., 7 Platt St., New York.)

2 lbs. Acetic Acid.

Enter cold, work cold ½ hour, bring to 160° and dye at this temperature ¾ hour.

Maroon A gives a very deep and fast shade of maroon.

Recipe No. 55.

Gray on Cotton Yarn.

St. Denis Autogene Gray on 100 lbs. of cotton yarn.

Prepare the dye bath with

2 lbs. St. Denis Autogene Gray.
(Sykes & Street, 85 Water St., New York.)

5 lbs. Soda Ash.

5 lbs. Common Salt.

Enter at or near the boiling point and dye at a boil for one hour. Lift, wash well, and dry.

St. Denis Autogene Gray is the same as St. Denis Autogene Black, but is designated as the gray when used for producing light shades. It exhausts completely with this percentage, and consequently the full amount of color should be used for each succeeding bath. No fixing is required, and the shades produced stand light, soaping, milling acids and alkalies.

Please recommend to avoid the use of copper fittings and utensils.

Recipe No. 56.

Yellow on Cotton Yarn.

Azomine Yellow D on 100 lbs. cotton yarn.

Prepare the dye bath with

3 lbs. Azomine Yellow D.
(United Indigo and Chem. Co., 176 Federal St., Boston.)

½ lb. Sodium Carbonate.

20 lbs. Glauber's Salt (Calcined).

Dissolve dyestuff by pouring boiling water on it and adding solution slowly to dye bath.

Enter yarn at 150° F., bring slowly to a boil and boil ¾ of an hour.

Azomine Yellow D produces a shade of golden yellow, going on the fibre evenly, and possessing all the valuable properties of the direct cotton colors.

Recipe No. 57.

Scarlet on Worsted Yarn.

Scarlet R D on 100 lbs. of worsted yarn.

Prepare the dye bath with

3 lbs. Scarlet R D.
(Read, Holliday & Sons, Ltd., 7 Platt St., New York.)

10 lbs. Glauber's Salt.

4 lbs. Sulphuric Acid.

Enter at 180° F., bring to a boil and dye at a boiling temperature for about one hour, exhausting the dye bath if possible.

Scarlet R D produces a brilliant and pleasing shade of scarlet red.

Recipe No. 58.

Black on Worsted Yarn.

Wool Black 6 B W on 100 lbs. of worsted yarn.

Prepare the dye bath with

5 lbs. Wool Black 6 B W.

(Berlin Aniline Works, 72 Front St., New York.)

10 lbs. Calcined Glauber's Salt.

5 lbs. Acetic Acid.

Enter at 140° to 160° F., raise to a boil and boil ½ to ¾ hours, then add

5 lbs. Bisulphate Soda.

2 lbs. Sulphuric Acid.

and continue boiling until the bath is exhausted.

Wool Black 4 B W possesses excellent leveling and penetrating properties and beauty of shade which remains unchanged in artificial light and also has good resistance to acids, alkalies and light.

Recipe No. 59.

Yellow on Cotton Yarn.

Mikado Yellow S G on 100 lbs. cotton yarn.

Prepare the dye bath with

2 lbs. Mikado Yellow S G.

(C. Bischoff & Co., 87-89 Park Place, New York.)

20 lbs. Common Salt.

Enter at 170° F., bring to a boil and dye at that temperature for one hour.

Mikado Yellow S G produces a shade of yellow exceedingly fast to sunlight, acid, alkali, chlorine, and other color-destroying agencies.

Recipe No. 60.

Black on Worsted Yarn.

Chrome Fast Black B B on 100 lbs. worsted yarn.

Prepare the dye bath with

5 lbs. Chrome Fast Black B B.

(A. Klipstein & Co., 122 Pearl St., New York.)

20 lbs. Sodium Sulphate.

2 lbs. Acetic Acid.

Enter at 135° F. and bring slowly to 180°, and add

1 lb. Acetic Acid,

then bring to the boiling point, boil 10 minutes and add

2 lbs. Acetic Acid.

Boil 20 minutes further and add

2½ lbs. Sulphuric Acid,

and after 15 minutes more boiling add

2½ lbs. more of Sulphuric Acid.

Boil 15 minutes further and add

1½ lbs. Potassium Bichromate,

and continue the boiling ½ hour and then wash and dry.

Chrome Black B B produces a shade of black of excellent fastness to the common color destroying agencies.

Recipe No. 61.

Black on Cotton Yarn.

Katigen Black 2 B on 100 lbs. cotton yarn.

Prepare the dye bath with

20 lbs. Katigen Black 2 B.

(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)

20 lbs. Sodium Sulphide.

8 lbs. Soda Ash.

30 lbs. Common Salt.

Enter at or near the boil and dye at this temperature for one hour.

Rinse in a bath containing

3 lbs. Sodium Sulphide,

then after-treat with

2 lbs. Potassium Dichromate,

2 lbs. Copper Sulphate,

3 lbs. Acetic Acid,

at 160° F. for 20 to 30 minutes.

Katigen Black 2 B produces a fast shade of black, which possesses all the valuable characteristics of the sulphur colors.

Recipe No. 62.

Yellow on Cotton Yarn.

Fast Cotton Yellow R on 100 lbs. of cotton yarn.

Prepare the dye bath with

2 lbs. Fast Cotton Yellow R.

(C. Bischoff & Co., 87-89 Park Place, New York.)

25 lbs. Common Salt.

Enter the yarn at about 180° F., bring to a boil and dye at a boiling

temperature for about one hour.

Fast Cotton Yellow R possesses all the characteristic properties of the direct cotton colors, goes on the fibre evenly and has good fastness.

Recipe No. 63.

Black on Cotton Yarn.

Melanogen T on 100 lbs. of cotton yarn.

Prepare the dye bath with

16 lbs. Melanogen T.

(Victor Koechl & Co., 122 Hudson St., New York.)

2 lbs. Sodium Carbonate.

50 lbs. Common Salt.

Enter at 176° to 194° F. and dye at this temperature one hour.

After-treat 20 to 30 minutes in a bath containing

3 lbs. Zinc Sulphate,

1½ lbs. Copper Sulphate,

at a temperature of 120° to 140° F.

Melanogen T, although a regular sulphur color, may be dyed without the use of Sodium Sulphide, and in ordinary dyeing apparatus.

Melanogen T produces deep blacks on loose material, cops, yarns and warps. It is of low cost, simple application, and with great fastness to washing and light. Copper apparatus should be avoided.

Recipe No. 64.

Orange on Cotton Yarn.

Columbia Orange R on 100 lbs. cotton yarn.

Prepare the dye bath with

3 lbs. Columbia Orange R.

(Berlin Aniline Works, 72 Front St., New York.)

20 lbs. Common Salt.

Enter at 170° F., bring to a boil and dye at that temperature for one hour.

Columbia Orange R produces a shade between brown and orange and possesses all of the characteristics of the direct cotton colors.

—Nothing so ensures the repose of the heart as the activity of the mind. —De Levis.

Experiments in Mercerization.

In a paper by M. Grosheintz read recently before the Soc. ind. de Mulhouse, the author gives the results of some experiments, made by himself, in mercerizing cotton. He used for the tests pieces of cloth, about four inches long and two inches wide, these being the dimensions determined by the size of and distance between the clamps of the dynamometer. In the first column of the following table is given the strength of the mercerizing, liquor; in the second column is found the tension indicated in pounds; in the last column the time in minutes during which the contraction of the cloth continued is given:

Solution.	Tension lbs.	Duration of Shrinkage, minutes.
1. 38° B. Soda	5.3	4
2. 90% 38° 10% Water	5	5
3. 80% 38° 20% Water	4.2	5
4. 70% 38° 30% Water	4	5
5. 60% 38° 40% Water	3.5	5
6. 50% 38° 50% Water	3	5

Grosheintz draws the following conclusions from his experiments: The degree of contraction is nearly proportional to the strength of the liquor. The tension varies with the condition and weight of the fabric. Subjecting the cloth to tension previous to impregnation does not cause any increase in tension during the subsequent saturation in the soda solution.

A Small Bleaching Plant for Cotton Waste.

Editor Textile World:

I noticed in the March issue a description of a bleaching plant for cotton waste, and will give you my idea of such an outfit. The machinery would be as follows: Two (2) raw stock machines; one (1) hydro extractor; one (1) drier.

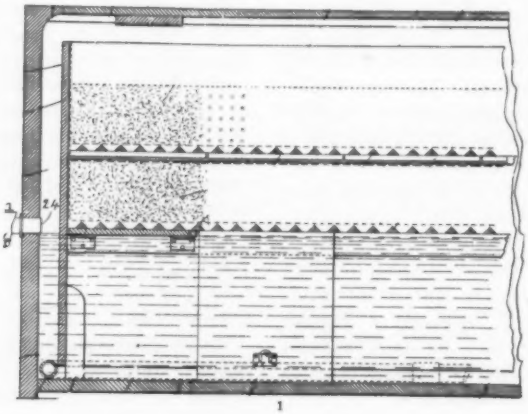
The bleaching of raw stock is not a process that can be recommended; it is preferable to bleach the yarn, as it is not easy to bleach raw stock uniformly and thoroughly. It is very seldom that one can bleach raw stock so that it will come out even, and even if the stock is well bleached, it

becomes dirty before it is made into yarn. Two men with the machinery that I have mentioned, could handle 800 to 1000 lbs. per day.

To bleach yarn, the following machinery would be required:—one (1) keir; four (4) kettles; one (1) hydro extractor; one (1) drier. With such an outfit, three men could handle 1100 lbs. of yarn per day.—Crescent.

bottoms of the sides of the vessel do not reach to the bottom of the vat, but are supported upon suitable standards.

A steam-pipe is carried around the bottom of the vat outside the inner vessel. This pipe is made with perforations in the top and is supplied with steam, preferably, by two inlets. The inner vessel has a false



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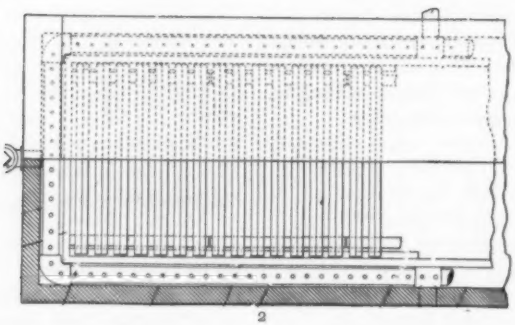

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A Raw Stock Dyeing Machine.

Figure 1 represents a longitudinal section of a dyeing machine for raw stock, invented in England, which has recently been patented in this country. Fig. 2 is a plan view of the same with one side of the vat in section to show the interior in full.

The vat contains an inner vessel, the sides of which are fixed a certain distance from the walls of the vat, so as to leave a space on all sides. The bottom consisting of cross-bars, covered with canvas or like material, and the material to be treated is placed upon this false bottom, and a canvas cover placed over it.

Instead of completely filling the vessel, a removable horizontal partition supported on side bars, may be placed over the material on the false bottom. In this case the partition is also covered with canvas, and a covering of canvas is placed over the material.

The stock to be treated is shown in

Fig. 1. The sides of the inner vessel may be made of open-work or with perforations, in which case they are covered with canvas.

The vat is filled with dye or other liquor, approximately to the level of the false bottom and to prevent this point being exceeded, an overflow pipe, fitted with a stop-valve, is used.

Steam, when turned on heats the liquor and drives it through the space between the two vats and the inwardly-curved rim of the sides of the vat and the cover cause it to flow over into the top of the inner vessel.

Forcing the liquor in this way produces a suction or partial vacuum under the material, which tends to draw the liquor flowing into the top of the vessel back through the material, and the canvas insures uniform distribution.

To prevent the liquor passing directly through the material, hinged doors many be fitted on the under side of the false bottom. One of these doors is shown in section in Fig. 1, and another is shown in full by the side of it. The doors are closed by chains or ropes attached to the staples, extending up to the top of the vat. Closing one or more of the doors causes a portion of the liquor to flow in an inclined or lateral course through the material.

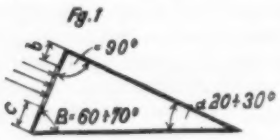
Lighting Dyehouses and Bleacheries.

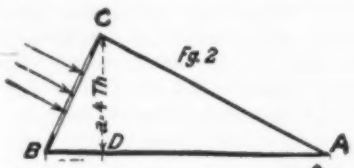
The question of how to light dyehouses and bleacheries is of great importance. The principal difficulty consists in the irregularity of the daylight, which not only varies with the intensity of the sun's rays, but is also affected by the reflection from the walls and other surfaces outside the mill. To avoid the direct sun's rays the usual practice is to place the windows in the roof with a northern exposure. It is here the one story buildings offer the greatest advantages, since the light can be distributed uniformly throughout the interior of each room. With the windows in the side, the light is very bright next to these openings, but the room becomes dark the farther one is removed from the windows; frequently, the space between machines is too dark for the operatives to work to advantage. Direct sunlight often causes damage to wet goods containing acids or chlorine, and to those colored delicate shades. Bright sunlight often causes a blur, which prevents the goods from being examined. This difficulty is lessened by coating the window lights, but this is apt to give rise to another trouble, by changing the character and quantity of the light.

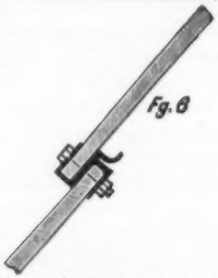
When glass is inserted along the ridge of a roof, it is very difficult to make tight joints, and in consequence, the roof is constantly in need of repair. With this form of construction the accumulation of snow in winter, and dirt at all times are serious objections. The pitch of the roof should not be less than the ratio of 1 to 2, otherwise, too small a quantity of light is admitted. The area of the glass surface should be from 1/3 to 1/2 of the floor surface to be lighted, and it should be borne in mind that no room can be lighted too well by sunlight. If it is not convenient to build the roof windows with a northern exposure, they should face either the east or the west, but never the south. The slant of the glass surface varies widely, and the steeper it is, the better it is adapted for the removal of snow, soot, water, etc.

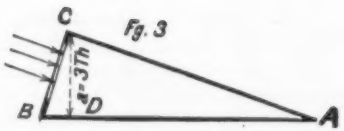
Fig. 1 shows a common form of construction. The window panes are at right angles with the roof; the angle, B, varies from 60 deg. to 70 deg.; the angle, a, from 20 deg. to 30 deg. To give strength to the roof, the frame work occupying the spaces, b (6 inches), and, c (12 inches), are left above and below the glass work. The space, c, should not in any case be less than 10 inches, on account of the conductor for water, which is placed at this point. The form of this style of roof that gives the best results is shown at Fig. 2. The distance from

the top of the roof, C, to the point, D, is equal to four tenths of the space, A B; the distance from B to D is equal to 1/10 of A B. Smooth or corrugated



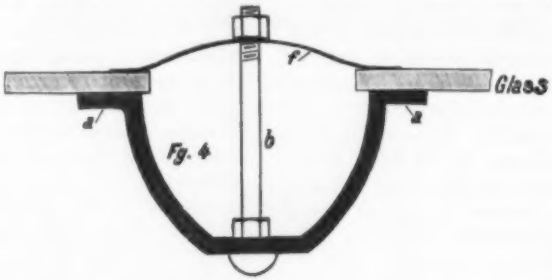


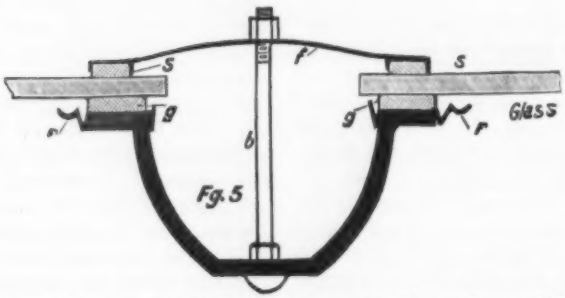




glass is used for the windows, and lately wired glass has been introduced.

Iron is the cheapest material for the frame of the roof. The glass should lay over the edge of the iron about 1/3 of an inch, and sufficient space (about 1/6 of an inch) should be left between the edge of the glass and the reglet to allow for expansion and contraction caused by variations of temperature. The joints are then cemented, but as the water is apt to leak through these seams, gutters are provided for carrying off the drippings caused by condensation on the glass. The ordinary glazier's putty should not be used for cementing, as it becomes hard and brittle. A better material is made with 2 parts of rosin and 1 part of tallow melted





together, to which a certain quantity of red lead is added. This material is elastic and is, therefore, much better for the purpose than ordinary putty.

Fully as important as cementing, is the method of joining the edges of the glass together. In place of the ordinary T iron, the method illustrated at Fig. 4 can be used to advantage; it is more expensive, but is much superior, as it facilitates the repairing of the windows. The upper surface of the flanges, a a, are polished for the reception of the glass, which is held down by the spring, f, held in place by the bolt, b. The desired pressure is obtained by screwing down the nut of this bolt. To avoid rust, the bolt instead of being fastened to the bottom of the iron work as shown in Fig. 4, may be attached to the side. In place of cement, strips of felt are sometimes used.

Fig. 5 shows another form of this construction, in which the gutters SS, are made of zinc, and serve not only to carry off the condensed water, but also to hold the strips of felt in place. To prevent breakage of the glass, strips of felt or rubber, GG, are placed between the iron and the glass. These strips are often surrounded by sheet zinc. The bolts are sometimes made of lead or copper, and the pressure is then maintained by riveting the copper or lead instead of screwing down the nut.

Fig. 6 shows a glass pane lapped over the next one. The ends of the glass are covered with a shoe made of sheet zinc; the end of this shoe is bent to form a conductor for the condensed water, which is led to the main conductor below. The plates are fastened together with screws; in case sheet zinc is not used, the glass should lap over for a greater distance. —Leipziger Faerber Zeitung.

—It is not worth while to be curious about the future; it is so like the past. —Rochefort.

—Circumstances do not make, they reveal men.—Lamennais.

Bleaching Cotton.

A bleaching process for the removal of oil stains from cotton goods has been proposed to the Society of Mulhouse by a competitor for a gold medal. At a meeting of this society the process was approved by a committee, under whose directions tests had been made.

There are three modifications of this process. The first consists in the addition of turkey red oil to the lime solution; washing in hot water before souring.

In the second method the addition is made to the lime and soda, or caustic potash solution. In the first case, the oil is mixed in equal parts with colophonium before adding to the solution. In the second, one quart of the oil is added to each 26 cubic feet of caustic solution, standing at 2 degrees B.

Lastly, the pieces can, after singeing, be saturated with the oil and steam for 1½ hours, at a pressure of 1½ atmospheres, then washed in boiling water and bleached in the usual way.

Lisle Finish on Direct Dyes.

We understand that a process has lately been perfected by a well-known dyer for giving a lisle finish on hosiery dyed with direct dyes, without singeing, and that the process is applicable not only to colored goods, but to white goods which are intended for bleaching. The inventor goes further and claims that he can lisle and color the goods at the same time, giving the fabric the lisle finish and color desired in one operation.

—The latest report of the foreign trade of the Philippines is for last July, and reveals the interesting fact that cotton goods to the value of $516,455 were imported into the islands, and that of this amount 1 6/10 per cent. came from the United States.

MILL NEWS.

Cotton.

New Mills.

—*Alabama, Anniston. A company has been organized by Robert Lucas, previously reported interested in the establishment of a cordage mill here, with Stephen Noble, president; W. A. Hulsey, vice-president, and himself, general manager and superintendent. Operations are expected to start, April 1st, in a building which has been secured for the purpose. Plant will have a capacity of about 4000 lbs. cotton batting, twine, rope, window cord, etc., per day. It is thought that later cotton duck, drills or sheeting may be made.

—*California, Los Angeles. The new cotton mill proposed at this place, and of which S. D. Moore is the promoter, is to be about 200 by 60 feet, 2 stories high, brick. As soon as a site is secured, work will proceed toward organizing and incorporating the company.

—*Georgia, Tallapoosa. Stock has been subscribed toward the capital of the Tallapoosa Cotton Mill Co., with temporary officers as follows: J. C. Tumlin, president; M. V. Sewell, vice-president, and A. V. Howe, secretary. They expect to go actively at work on the building in a few days.

—*Kansas, Coffeyville. $50,000 has been subscribed by the citizens toward the necessary capital being secured by a stock company, which Edward B. Thaw is interested in forming, for erecting a cotton mill here. The projected plant is to have an equipment of about 10,000 spindles.

—*Massachusetts, Fall River. The new mills to be established here will be known as the Davis Mills, capitalized at $500,000, with Leontine Lincoln, president, and J. B. Richards, treasurer and agent. They will make fine and fancy goods, using 40s to 100s yarn. Equipment will consist of 40,320 spindles and 900 looms. Goods will be sold direct. They expect to be ready to start production of goods Jan., 1903.

—Massachusetts, Fall River. Another mill is reported to be erected by the Fall River Iron Works Co., of which M. C. D. Borden is president. It is expected that the mill, which will probably be a duplicate of mill No. 4, will be in operation by February, 1903, and will contain not less than 80,000 spindles.

—*Massachusetts, Fitchburg. The Sun Mills Mfg. Co., capitalized at $95,000, is name of the concern which will operate the old Glen Woolen Mills at West Fitchburg. Peter H. Corr is president of the company; Geo. T. Hoffman, treasurer, and C. W. Cockran, agent. They will make cotton cordage, wick and twine, selling goods direct. Mill has a dyehouse attached.

—*Massachusetts, New Bedford. The large plant of the Soule Mills is nearing completion, and it is thought that same will be running in about three months. The carding and picking department will be located on the lower flooor of the main mill, or spinning mill, and the mule rooms, on the second and fourth floors. The weave room is a one-story building, 352 by 250 feet, with saw tooth roof, and will contain about 1300 looms. The spindles will number about 90,080. Fine goods will be made, and it is proposed using yarns as fine as 250's. John Neild will have the superintendency of this large plant.

—Massachusetts, Westfield. Edwin L. Smith, formerly treasurer of the Warren Thread Works, has purchased a lot of land upon which he will erect a new building to be equipped with machinery for manufacturing all kinds of threads. Work will be started as soon as possible on the building and pushed to completion. A company will be formed to operate same.

—*North Carolina, Huntersville. The addition to the Anchor Cotton Mills is nearing completion. This building, which is 200 by 75 feet, 2 stories, with engine and boiler rooms, will be used for weaving only.

—*North Carolina, Rockingham. The new cotton mill to be erected here by the Roberdel Manufacturing Co., will be known as Mill No. 2 and will be equipped with about 7500 spindles and 350 looms.

—Rhode Island, Pawtucket. Wm. G. Etchells has recently started manufacturing fancy shirtings at this place, operating 20 looms.

—*South Carolina, Anderson. H. C. Townsend previously reported to start a rope and twine mill here advises us that he will make wrapping twine, but has not yet made complete arrangements for the machinery, nor as to who will sell the product.

—*South Carolina, Clinton. The new mill in which the Messrs. Bailey are interested, is now under construction, and will be known as the Lydia Cotton Mills. The capital stock will be placed at $60,000. M. S. Bailey is president and C. M. Bailey, treasurer and buyer. Will operate 5000 ring spindles and 150 looms. Haines & Bishop will sell the goods. A portion of the machinery, spinning and carding, will be removed from a Richmond (Va.) mill.

—*South Carolina, Easley. The new mill to be built here will be known as the Glenwood Cotton Mill. Company has capital stock of $200,000. W. M. Hagood is president and treasurer of the company. They will manufacture fine sheetings and will operate about 10,000 spindles. The organization of the company is not yet complete.

Enlargements and Improvements

—Alabama, Anniston. Geo. B. Carpenter & Co., of Chicago, Ill., have secured control of the Anniston Cordage Co., at this place, making braided sash cord, cotton lines, twines, webbing, etc. They

propose doubling the capacity of the mill by moving the braiding plant and machinery at Chicago, to this place.

—Arkansas, Helena. The Premier Cotton Mills have ordered more machinery, which will about double their present capacity. An additional building will be erected.

—*Connecticut, Moodus. Hall, Lincoln & Co., owners and proprietors of the Williams Duck and Stone Mills, and which recently purchased A. B. Chace's Mill, will operate same as the Chace Mill and will install about 1000 additional spindles in same. H. B. Fielding, Jr., will be superintendent.

—Georgia, Augusta. The Riverside Mills are to add a bleachery to their mill and will have same in operation in a few weeks.

—Georgia, Macon. The Willingham Cotton Mills, formerly operated on yarns, have installed about 120 looms for making heavy duck, such as hose and belting duck.

—Georgia, Valdosta. The Strickland Cotton Mills, operating 10,000 spindles and 325 looms, are considering the project of doubling the equipment.

—Maine, Lisbon. An addition, about 50 x90 feet, is to be built by the Farwell Mills, to the weave room.

—Maryland, Elkton. Ground has been broken for the erection of an addition 24 by 62 feet, to Deibert & Wilson's mill. The looms now in the old plant will be removed to the new addition, where 8 additional ones will also be installed.

—Massachusetts, Fisherville. A large quantity of new machinery, including 22 carding machines, 4 drawing frames and 4 fine jack frames is being set up in the Fisher Mfg. Co.'s mill.

—*Massachusetts, New Bedford. The Dartmouth Mfg. Corpn., which is making extensive additions to their mills, and when completed, will double the capacity, is now receiving shipments of picking, cards, drawing and speeders from the Howard & Bullough American Machine Co., Ltd., Pawtucket, R. I., with whom the entire order for card room machinery was placed.

—*Massachusetts, New Bedford. The Whitman Mills, recently reported to erect a new mill, will install 38 (Asa Lees & Co.) self-acting mules.

—Mississippi, Meridian. The Meridian Cotton Mills will expend about $40,000 in purchasing new carding and spinning machinery. After the new machinery is installed they will discontinue night operations.

—New Hampshire, Nashua. The Nashua Manufacturing Company is to build an addition, 73 by 120 feet, two stories, to the dye plant, and work will be started shortly on construction. A new system of dyeing is to be introduced at the mill.

—New Jersey, Newark. The Clark Thread Co. will install 20 new boilers in their extensive mills, replacing ones now in use.

—New Jersey, New Brunswick. Contract has been awarded by Johnson & Johnson for the erection of a three story addition to their mill.

—North Carolina, Concord. Work has been started on the foundations for an addition to Mill No. 3 of the Cannon Mfg. Co.

—North Carolina, Franklinville. The Franklinville Manufacturing Co. will make some improvements to the plant. They will build a new dam 370 feet long. The machinery to be installed has not yet been definitely decided upon.

—North Carolina, Hillsboro. The Eno Cotton Mills will shortly equip the mill with looms for weaving the yarns produced.

—*Pennsylvania, Chester. The Jordan Mfg. Co., previously reported to discontinue making yarn and to increase their loom capacity, advise us that the number of looms have been increased to 600 and the spinning discontinued as was reported. They have also added a warp dyeing and bleaching plant.

—Pennsylvania, Philadelphia. The E. H. Godshalk Co. has installed a dyeing department in their mill and now dye their own product.

—Pennsylvania, Philadelphia. The Lehigh Manufacturing Company, Fourth St. and Lehigh Ave., will build a new building, of slow burning mill construction.

—Rhode Island, Hope. The Hope Company contemplates erecting a large addition to the mill, but before plans are started, consent must be gained from the Council to cross a given street, connecting both plants with a bridge. The proposed addition will be about half as large as the present plant. The new addition is to be equipped with looms, while the old mill would be utilized for carding and spinning only.

—Rhode Island, Pawtucket. The John Kenyon Manufacturing Co. is to enlarge the plant.

—South Carolina, Belton. The Belton Mills are considering project of doubling the capacity of the plant, at present having 27,000 spindles and 700 looms.

—*South Carolina, Camden. The De Kalb Cotton Mills, which recently increased the capital stock, will install 5000 more spindles and 150 looms. They now operate 10,256 spindles and 260 looms on 4 1/2 yard goods.

—South Carolina, Charleston. The Royal Bag Yarn Manufacturing Company has increased the capital stock from $225,000 to $325,000.

—South Carolina, Seneca. The Seneca Cotton Mills have increased the capital stock from $200,000 to $300,000. They are to make some machinery additions to the plant.

—*South Carolina, Tucapau. The Tucapau Mills have installed 74 additional looms in the plant. Print cloths are made.

—South Carolina, Union. The Monarch Cotton Mills, to erect some additional

buildings, have recently installed 4000 more spindles and 60 looms in the mill, giving them a total of 14,000 spindles and 360 looms. The new buildings include three warehouses, a schoolhouse and 30 cottages for the operatives.

—*South Carolina, Walterboro. The Colleton Cotton Mills, previously reported to build an addition to the mill, will add about 150 looms, of probably Crompton & Knowles make.

—*South Carolina, Yorkville. The capital stock of the Tavora Mills, formerly known as the Sutro Mills ,has been increased $25,000, which will be used for purpose of making additions and improvements to the plant, which now operates 6,912 spindles.

—Tennessee, Humboldt. The Humboldt Cotton Mills will increase the capacity of the plant by installing new machinery and will receive bids for same until April 15th, orders to be placed shortly thereafter. The requirements are: 1 finisher lapper, 5 cards, 1 drawing frame, 1 slubber, 1 intermediate, 1 speeder, 4 spinning frames, 1 spooler and 50 looms.

—*Tennessee, Knoxville. The Knoxville Cotton Mills Co. will erect a new building, 100 by 80 feet, 2 stories high. They have not yet made a definite decision on the machinery to be installed.

Mills Starting Up.

—*Georgia, Tennille. The Tennille Cotton Mills are to be put in operation again under supervision of B. E. Willingham (Macon, Ga.), trustee.

—*Georgia, Waynmanville. The Waynman Cotton Mills, recently reported purchased by a new concern, will be operated as the Upson Mfg. Co. and will be so incorporated. R. P. Brooks will be president and J. H. Huddleston, general manager. The office will be located at Forsyth, from which place product will be sold.

—*Louisiana, Monroe. Operations have been started in the Ouachita Cotton Mills.

—Massachusetts, Westfield. William Salmon of New York has purchased the Westfield Braid Company's plant, which has been idle recently. Work has been started up in the mills. They will manufacture silk braids in addition to that already made at the mills.

Mills Shutting Down.

—Georgia, Atlanta. Operations will be suspended shortly in the Annestown Cotton Mills, making duck, osnaburgs, yarns and men's hose.

Woolen.

New Mills.

—*Connecticut, Central Village. The Plainfield Woolen Company's new mill will soon be in full operation. This company is capitalized at $100,000, and manufactures fancy worsteds and woolens. C. Bragg is treasurer and J. F. Milner, secretary of the mill, which is equipped with 5 sets and 40 looms. A dyehouse is also attached to the mill. Faulkner, Page & Co. will sell the goods.

—Massachusetts, Auburn. The Hogg Carpet Co. has been organized with capital stock of $15,000 to operate the Stoneville Worsted Mills. Henry A. Moore (Flushing, N. Y.), is president and William F. Hogg, (Worcester) treasurer. Mr. John C. Uhrlaub of Buenos Ayres is vice-president of the company. They will manufacture the best quality of Wilton and Brussels carpets and rugs.

—*Massachusetts, Lowell. The Massachusetts Mohair Plush Company, which is to erect a new mill, will have a total number of 12 combs, 58 looms and 17,000 spindles, about 3000 of which are to be twister spindles when completed. They will also make novelty yarns.

—*Massachusetts, Worcester. J. E. Cunningham is superintendent of Wm. Jas. Hogg & Co.'s mill, recently started up here for making worsted yarns. They are operating 3599 worsted spindles. Plant is run with steam and water power.

—Michigan, Rochester. A new concern for manufacturing wool substitutes has been recently started here as the Rumsey Wool Stock Co. Mr. J. Godfrey is in charge of the plant. Mill has an equipment of three sets of machinery, to be increased later.

—*New Jersey, Changewater. Work is nearly completed on the buildings, etc., to be put in operation shortly by A. T. Skerry & Co., for making yarns. The plant will be in active operation on the 20th inst. Geo. Howarth is superintendent of the plant, known as the Hopatcong Worsted Mills.

—*Ohio, Ashtabula. The Ashtabula Worsted Mills, of which E. W. Savage is president; A. Dalin, vice-president and treasurer; Fred A. Briggs, secretary and Chas. E. Briggs, general manager, expect to have the building for the plant ready for machinery about July 1st. The mill will be equipped with the latest improved machinery for making waistings, dress goods and worsted suitings. Electric power is to be used.

—*Ohio, Madisonville. Operations will be started shortly in the new plant of the Madisonville Woolen Mills Company. This is the plant in which Messrs. Kressel and Dieckmann are interested.

—*Ohio, Mount Vernon. The J. S. McConnell Wool Company has been incorporated with capital stock of $100,000, at Charlestown, W. Va. They propose manufacturing woolen goods. J. S. McConnell, of J. S. McConnell & Co., hides and wool, Leander Hays, F. S. McConnell and A. C. Collins are the incorporators. About two years ago the matter of locating a woolen mill was somewhat discussed, but nothing developed at the time.

—*Oklahoma Territory, Oklahoma City. The new woolen mill to be established here, and about which much has been said, will be by company organized as the Oklahoma City Woolen Mills Co., capital stock of $100,000. Some of the machinery will be removed from a plant in another location. Mr. Newby is largely interested in the enterprise.

—*Pennsylvania, Reynoldsville. The new mill to be started here by G. W. Sykes & Son, making meltons, will be put in operation about June 1st. They will operate one set of cards and 6 broad looms, using steam power. A dyehouse will also be attached. Goods to be sold direct.

—South Carolina, Rock Hill. R. T. Fewell is interested in erecting a cotton waste mill near the Arcade Mills, 60x75 feet, for utilizing the waste of cotton factories, in manufacturing felt and commercial bats. Later shoe linings and soles, etc., will be made. A 60 h. p. boiler and 35 h. p. engine will be used.

—*Virginia, Norfolk. The Norfolk Mfg. & Spinning Co., recently reported organized with capital stock of $25,000, has leased the plant formerly operated by the Powhatan Mfg. Co., and will manufacture carpet yarns. E. Vance is president of the concern and F. M. Killam, treasurer. They operate six sets of cards. Sell product direct.

Enlargements and Improvements.

—Connecticut, Rockville. An addition 100x70 feet, four stories high, will be built to the Springville Mfg. Co.'s plant.

—Indiana, Peru. The Peru Woolen Mills, recently closed on account of failure of the Turner Manufacturing Co., have been purchased by the Racine (Wis.) Woolen Mills. The mill will be operated in connection with the company's main mill.

—Maine, Dexter. The Morrison Woolen Co. will remodel the old buildings known as "The Tannery." The main building will be used for a woolen mill and work will start at once on alterations. They will make additions and improvements to the present plant known as the White Mill, where all the goods will be finished. The new plant will be equipped with two sets of cards, 3 mules and 24 looms. A sprinkler system and new water wheel will also be installed.

—*Maine, Hartland. The Linn Woolen Co., reported having purchased machinery from the Hillsborough Mills, Wilton, N. H., have bought 2 sets of cards, 2 mules, 2 Cleveland dryers and 20 looms, 12 of which R. Dobson & Co., Pittsfield, Me., are running.

—Maine, Pittsfield. Two additions will be built to the Pioneer Woolen Mills, Robert Dobson & Co., proprietors. One building will be about 85 by 50 feet, one story, and will be used for fulling, scouring and drying goods; the other will be about 120 by 70 feet, two or three stories, the first story of which will be occupied by spooling and dressing departments, while part of the second will be utilized for spinning. Some additional looms will be installed and the spinning machinery increased.

—Massachusetts, Clinton. Work will soon be started by the Bigelow Carpet Co. on construction of the new power house, for which designs have already been prepared.

—Massachusetts, Franklin. A large dyehouse is to be built this spring by the Singleton Worsted Co.

—Massachusetts, Holyoke. Beebe, Webber & Co. have leased additional room in the building which they now occupy and have installed 26 looms, a winding machine and dresser in same.

—*Massachusetts, Lawrence. Rutter Bros., manufacturers of woolen and merino yarns, Lakeport, N. H., are removing to the Wamesit Mill at this place, where they are putting in one more set of cards and 2 mules, 672 spindles, giving them a total, when completed, of 4 sets and 5 mules, 1744 spindles. They expect to be ready for operations April 1st.

—*Massachusetts, Millbury. Operations will be started in full within a month in the No. 2 mill of the Mayo Woolen Co. This mill, formerly the old Wheeler Mill, will be equipped with 4 sets and 36 looms, 18 of which have already been set in position.

—Massachusetts, Monson. Heritage & Hirst have recently completed installation of an additional set of cards, a finisher and a boiler in the mill.

—New Hampshire, Lebanon. Carter & Rogers, manufacturers of repellents, propose building an addition to the mill, and increase the machinery from 5 sets to 8 and the looms to 100. A special town meeting will be held on the 24th inst., to see if they will be exempted from taxation for all additions in building, machinery, etc., for a period of ten years.

—New Hampshire, Rochester. The Rochester Woolen Co. is adding 20 more looms to the mill equipment.

—New York, Falconer. The Falconer Worsted Mills are to double the capacity of the mill. They have sufficient floor space and will proceed to install machinery to be ordered from abroad. Company will be incorporated with capital stock of $100,000.

—Pennsylvania, Glen Riddle. The Riddle Mills, formerly operated by Samuel Riddle's Sons, have been purchased at Sheriff's Sale, by John Dobson, of Philadelphia, for $60,000. The mill will be remodelled for making carpets.

—Pennsylvania, Norristown. The Coral Mfg. Co., manufacturers of art squares, has recently started making granite ingrains, 4/4 and are installing new looms.

—*Pennsylvania, Philadelphia. Geo. Carson & Son, recently reported having purchased the five art square looms operated by A. Holmes & Son, have added 7 broad looms to the mill in all.

—Pennsylvania, Philadelphia. An addition will be built to the Bradford Mills, operated by J. & J. Dobson.

—Pennsylvania, Philadelphia. Another story, making four, about 501 by 58 feet, will be added to the large carpet mill operated by Joseph H. Bromley, Lawrence Street and Lehigh Avenue.

—*Pennsylvania, Philadelphia. The Bromley Bros. Carpet Co. will operate the mill of Barnes & Beyer in connection with their present plant, making Smyrna rugs and Axminster rugs, giving them an additional number of 135 looms.

—Pennsylvania, Philadelphia. The Winfield Manufacturing Co. has started moving the machinery to their new plant on

Allegheny Avenue. As only part of the machinery can be removed at a time, so that mill can be kept in operation in order to keep up orders, it will take about a month before they are completely located.

—*Rhode Island, Peace Dale. The Peace Dale Mfg. Co., previously reported to make an addition to the plant, in which about 50 more looms will be installed, will also build an annex to the worsted mill, 60 by 25 feet, 4 stories high and a new finishing room, 102 by 50 feet, 3 stories, with an ell of 3 stories, 83 by 50 feet. The above enlargement will necessitate the installation of new engines of sufficient power to run the entire plant.

—Vermont, Ludlow. F. W. Agan contemplates doubling the capacity of his shoddy mill, and will start work on the foundation for new building as soon as weather permits, and will also increase the capacity of his drying and carbonizing plant.

Mills Starting Up.

—*Connecticut, Norwich. The Otrobando Woolen Mill, long idle and for sale, has been secured by W. G. Hitchon of the Glen Woolen Mills, Shewville, Conn., to assist in filling the numerous orders on hand. Thibet for men's wear will be manufactured, the yarn coming from the Shewville Mill. Later it is thought that ladies' cloth will be made.

—*Illinois, Fairfield. A. H. Baker, formerly connected with the Carthage Woolen Mill Company, whose plant has been shut down with little prospect of resuming, has become interested in the Fairfield Mills, which will be started up in 30 or 40 days.

—*West Buxton, Me. The Barr Mills, of West Buxton, Me., containing two sets woolen cards has been leased for a term of years by Martin & Marble. Fancy cassimeres will be manufactured and operations are to be begun at once. The lease was negotiated through the well known agent for mill property, R. B. Denny, 143 Federal Street, Boston.

—*Massachusetts, Spencer. About 42 looms are now in operation at the Red Mill, recently purchased by H. C. Leavitt, of New Boston, Conn.

Knit.

New Mills.

—*Alabama, Alexander City. The Russell Manufacturing Company has been incorporated with capital stock of $50,000. Benj. Russell is president and G. C. Russell, treasurer. They will start operations about April 1st, making ladies' underwear.

—Alabama, Alexander City. J. R. Watkins and J. L. Thornton are interested in starting up a plant for making hosiery.

—*Georgia, Tallapoosa. W. C. Kimball & Co. is name of the new concern, which has just started manufacturing misses' and children's ribbed hosiery. They operate 8 knitting machines and 16 cylinders, using steam power. W. C. Kimball is superintendent of the mill, while W. H. Kimball is buyer of the plant.

—*Indiana, Elkhart. The machinery, including a steam plant, is being installed in the branch mill of the Lakeside Knitting Co., of Michigan City, recently located here. They will make men's and ladies' fancy golf gloves.

—*Kentucky, Mayfield. The Mayfield Knitting Mills is name of the company in which J. K. Reynolds has been interested in organizing. Arrangements are now being made regarding the buildings, machinery, etc.

—Maryland, Elkton. A knit goods mill is now in operation here of which Charles Nelson is proprietor.

—*New Jersey, Alloway. The new knitting mill to be established here will operate the machinery of the Priscilla Knitting Mills, at Salem, N. J., which has been removed to this place. The building is about ready to start, with the exception of the power, not yet installed.

—*New York, Canastota. E. E. Randall expects to have the new mill for making cotton half hose, 176 needle, ready to start April 1st. Building is now under construction.

—*New York, Herkimer. The Brooks Manufacturing Co. has recently been incorporated with capital stock of $15,000. Cyrus Kay, Jr., is president; Duane M. Richardson, treasurer and M. W. Brooks, secretary and manager. They will manufacture sweaters, using steam power to operate the mill. Machinery equipment has not yet been decided upon nor installed in the building to be occupied.

—*New York, New Hartford. The Olympian Knit Goods Co., erecting a new mill here, has increased the capital stock from $40,000 to $60,000. They expect to be in the new mill May 1st.

—*New York, Rochester. J. E. Pulver is president and H. J. Marsh treasurer of the Acme Hosiery Co., recently incorporated by L. J. Gruber, who is vice-president and manager, to operate Mr. Gruber's knitting mill. They manufacture men's half hose, using 1/24s to 1/28s combed Egyptian yarn, operating 7 Branson machines. They propose installing more machinery and increasing the business.

—New York, Utica. The La Toska Knitting Company has been incorporated with capital stock of $6,000 to manufacture knit goods.

—*North Carolina, Lincolnton. The John Rudisill Mfg. Co., previously mentioned as to start manufacturing yarns and warps, will manufacture hosiery and knit underwear instead. They will start making misses' and ladies' ribbed hosiery, for which machinery will be installed at first. Company's present capital stock is placed at $30,000.

—Pennsylvania, Honesdale. The Maple City Knitting Mills, capitalized at $12,000, will start work shortly making fancy high grade sweaters. John Riefer is president of this company and L. .B. Guckenburger, secretary and treasurer.

—*Pennsylvania, Reading. The new knitting mill reported started here by Harry A. Leinbach and Howard H. Schmeck, is known as the Stork Knitting Mills. They make men's medium half hose. Plant is operated by steam. Sell goods direct.

—Utah, Salt Lake City. The Salt Lake Knitting Works is a new concern recently incorporated with capital stock of $50,000. James A. Hendrickson, formerly of the Cache Knitting Works, Logan, is president of the concern; Joseph F. Smith, vice-president, and J. R. Smith, secretary and treasurer. Arrangements are now under way for purchasing the machinery equipment, and operations will be started as soon as possible.

—*Virginia, Portsmouth. The Piedmont Manufacturing Company has completed arrangements for installing the machinery, etc., in the new building, reported under construction some time ago. It is hoped that the plant, which will be equipped for making ladies', misses' and children's underwear, will be ready to start operations April 1st. Mill will have a capacity of 300 to 350 dozen per day. L. B. Whatley is largely interested in the new enterprise.

—Wisconsin, Milwaukee. A new building, 120 by 60 feet, five stories high, of slow burning construction, brick, is to be erected corner Broadway and Chicago streets, for the Phoenix Knitting Company to occupy. A large electric power plant and the dye rooms will be installed in the basement. The general offices will occupy the first floor, finishing department, the second; the storage, packing and shipping departments, the fourth and fifth. This concern makes mittens and gloves, silk, saxony, worsted and woolen.

Enlargements and Improvements.

—New Hampshire, Manchester. The Elliott Manufacturing Company is to erect a large addition to the mill, about 120 by 50 feet, three or four stories. Plans have been prepared and proposals have been invited for building same. The addition will be used for storage purposes.

—New York, Utica. The old Utica Steam Woolen Mills property has been remodelled and equipped with machinery and recently put in operation by the Utica Knitting Company, which secured the plant in order to increase the facilities for increased production.

—North Carolina, Shelby. E. A. Welman has secured an interest in J. F. Williams' hosiery mill. Plant is to be doubled.

—North Carolina, Washington. The Washington Knitting Mill, of which J. Havens, president and manager, is interested in a small dye plant which they are to install in the mill.

—*Pennsylvania, Hazelton. Wilde & Co., reported last December to make an enlargement to their mill, are now installing new knitting and finishing machinery in the plant.

—Pennsylvania, Mohrsville. James H. Wagner & Co., proprietors of the Crown Knitting Mills, who have been contemplating the erection of an addition to the plant, have postponed building. They have leased the plant operated by H. S. Fraunfelter and will have both mills operating to their full capacity.

—Pennsylvania, Norristown. The Wyoming Mills, formerly operated by Dean & Mitchell, have been purchased by L. F. Childs, for $36,650 at Sheriff sale recently. It is understood that Mr. Childs represented John T. Dyer, Edward S. Adams and Robt. N. Selden, who will operate the mill as the Eureka Knitting Company. Enlargements will be made and new machinery added to the plant. The plant of the Eureka Knitting Mills, in which Mr. Adams is interested, will be removed to the Wyoming Mills and operated as one.

—Pennsylvania, Philadelphia. An addition, 34 by 43 feet, 3 stories, brick, will be built to the Rainbow Knitting Mills, Harry W. Thurman, proprietor, manufacturing athletic knit goods, shawls, etc. An engine and boiler house, 15 by 36 feet, one story, will also be built.

—Pennsylvania, Philadelphia. Contract has been let by the E. G. Chester Hosiery Company for the erection of a second and third story front addition, 40x100 feet and a one story rear addition to their plant.

—Pennsylvania, Spring City. W. C. Urner & Co. have recently completed erection of two new buildings in which they will install machinery for making full fashioned hosiery. They contemplate having the new addition in operation May 1st.

—*South Carolina, Jonesville. A recent advice states that the Jonesville Knitting Mills and the Alpha Cotton Mills will not be combined at present. The knitting mills have increased their number of machines from 40 to 100 full automatic knitting machines and established an office at 256 Church Street, New York.

Mills Starting Up.

—*Ohio, Wapakoneta. Jos. J. Walter is now sole proprietor of the Wapak Knitting Co.'s mill, in operation for about a year, but recently put in the hands of a receiver and subsequently reorganized. Knit goods for men and women, union suits are made a specialty. Five machines are operated. Goods are sold direct and through J. H. Conover, N. Y.

Silk.

New Mills.

—*Connecticut, Bethel. Operations have been started by the Bethel Silk Co., previously reported installing the machinery in the plant. Company is capitalized at $50,000. John Sprich is president and agent, and Max Doerken, treasurer and superintendent. Broad silks are made. Equipment consists of 50 wide looms with other necessary machinery. Steam is the power used.

—Maryland, Baltimore. M. C. Migel & Co., proprietors of the Astoria Silk Works, Astoria, N. Y., have started a branch mill here and have opened a school of instruction.

—*Maryland, Hagerstown. The Hagerstown Silk Co. has been incorporated by William Wingert, Dr. Frank Snyder, Charles W. and V. L. Cromer, with capital stock of $9000, to operate a silk plant.

—*New Jersey, Bayonne. Operations have begun in the new silk mill recently established here by Schwarzenbach, Huber & Co.

—New Jersey, Jersey City. The Cummunity Manufacturing Company has been incorporated by Alvah H. Moore, John G. Meyer and Frank Warburton, with capital stock of $125,000, to manufacture cotton, woolen and silk goods.

—*New Jersey, Vineland. The silk mill established here recently by M. Munson Searing, is for silk throwing on commission. Plant is under superintendency of Patrick O'Leary and is operated by steam.

—New York, Long Island, Whitestone. The old net and twine factory building on 20th Street, recently used as a school annex, has been purchased by Julius Schwarze, who will equip same for manufacturing silk ribbons and silk and mohair braids. Operations will probably start up early in May.

—*Pennsylvania, Lebanon. About 40 looms will be installed at first in the branch mill to be started here by Miller & Ward, of Paterson, N. J. Broad silks will be made at first. It is expected that operations will begin about June 1st.

—Pennsylvania, Meadville. Application has been made for a charter for the Home Silk Manufacturing Company, by Geo. W. Haskins, Henry K. McCluer, Edmund Noble, M. M. Small and John O. McClintock. They propose manufacturing silks.

—Pennsylvania, Philadelphia. The Sauquoit Silk Mfg. Co. has purchased five acres of land near Wayne Junction and will shortly begin the erection of another large mill.

—*Rhode Island, Valley Falls. The new mill of Reiling, David & Schoen, West Hoboken, is nearing completion. Some of the machinery has already been set up and put in operation, and it is thought that the greater part of the looms will soon be running, if the necessary help can be secured.

Enlargements and Improvements.

—Connecticut, Bridgeport. A one-story brick and steel building is to be erected by the Salt's Textile Co. Building will have a saw tooth roof and will be used for weaving purposes.

—Massachusetts, Florence. An addition is to be built to the Nonotuck Silk Co.'s plant. The lower floor will be equipped for dyeing.

—New Jersey, Hillsdale. An addition, 30 by 100 feet, is to be built to the silk mill and about 50 looms installed.

—Pennsylvania, Fleetwood. The Pennsylvania Silk Company has sold its interest in the mill to the New York Silk Manufacturing Company, previously reported at York, Pa., as incorporated, and to make enlargements to the mills. This plant will be increased to 200 looms.

—Rhode Island, Olneyville. Alexander Miller, operating a silk plant at Middletown, Conn., has started a mill for preparing silk at Kingsley Ave. and Eagle Street. Some of the machinery has already been put in position. From 75 to 100 people will be given employment.

Mills Starting Up.

—*New York, Delhi. Operations have been resumed in the Delhi Silk Mills, by the Delhi Silk Company, with W. M. and F. C. Gallant, managers. James Stern & Co., 43 Green Street, New York, will sell the product. About 35 people are now employed. It is expected that 100 more looms will be started up shortly. This plant has been closed for some little time.

Mills Shutting Down.

—Pennsylvania, Athens. Operations have been stopped for a while in the Tioga Silk Mill on account of strike among the operatives.

Miscellaneous.

New Mills.

—*Pennsylvania, Williamsport. The foundation for the main building of the Susquehanna Dye Works has been completed and work is progressing on construction of the walls.

Enlargements and Improvements.

—New Jersey, Montville. John Capstick's Sons are reported to make extensive improvements and additions to their dyeing and printing establishment. The addition of a new electrical plant is talked of among the additions.

—Pennsylvania, Philadelphia. Henry D. McCord Weir and Robert Foster have secured an interest in the Westmoreland Dye Works, of which Joseph Richardson was formerly sole proprietor. The company is now known as Richardson, Weir & Co. A new addition, 30 by 75 feet, 2 stories, will be made to the plant. They will install new machinery for yarn dyeing.

Fires.

—Massachusetts, Blackstone. The spinning mill at East Blackstone, formerly operated by Alfred Lange and subsequently by C. R. Day and Sumner Fairbanks, has been destroyed by fire. The loss is estimated at about $16,000.

—Virginia, Suffolk. The dye house of the Suffolk Knitting Mills, owned jointly by Cobb Bros. and J. S. Schneider, manager, has been destroyed by fire. The loss, which is estimated at $10,000, is partially covered by insurance.

Failures and Suspensions.

—Maine, Readfield. An assignment has been made by William Harvey & Sons, proprietors of the Readfield Woolen Mill, to Joseph Williamson, Jr., for the benefit of the creditors.

—*Ohio, Tiffin. The Guardian Trust Company of Cleveland, O., has been appointed receiver for Balbian Bros., upon petition filed by Frederick Balbian. The partners fail to agree.

—Rhode Island, Greenville. Richard Waterhouse of the Greenville Woolen Mills, has made an assignment to Walter A. Guile, one of the proprietors of the Earnscliffe Mill, at Olneyville. The liabilities are reported not to exceed $50,000.

Facts and Gossip.

—Alabama, Dothan. W. G. Robinson is getting prices on new knitting machinery, etc., for mill which he contemplates establishing.

—California, Santa Rosa. It is reported that Eastern capitalists are interested in the purchase of the Santa Rosa Woolen Mills, leased by W. C. Humbert, who owns the machinery, for purpose of converting same into a silk mill. The building is owned by M. E. Stahl and Dr. J. R. Gregory, who neither deny nor confirm the report.

—Connecticut, Bristol. The Bristol Manufacturing Company has absorbed the plant of the Plainville Mfg Co., Plainville, Conn. No changes will be made in the Plainville Mill, other than the management. The combined capital stock is $160,000.

—*Connecticut, Dayville. William P. Kelley has again been appointed trustee of the Dayville Woolen Co. and will operate the mill in order to use up the raw material now on hand.

—Connecticut, Willimantic. The E. J. W. Morse Co.'s thread mill at Roxbury, controlled by the American Thread Co., will be given up and the machinery will be removed to the No. 4 mill at Willimantic.

—*Georgia, Lawrenceville. The Lawrenceville Manufacturing Company has been incorporated with capital stock of $100,000 to operate the plant of the Gwinnett Cotton Mills, recently failed and subsequently reported purchased by other parties. T. J. Neacy and others are the incorporators.

—Iowa, Elkhorn. S. P. Kane, dealer in knit goods is considering the project of erecting a knitting mill and is looking over locations in near towns.

—*Kentucky, Louisville. The Covington Woolen Mills Company, capitalized at $50,000, will remove the plant, now at Covington, to this place. Some new machinery will be added. It was reported some time ago that a company was being formed for purchasing and operating the above plant. Men's suitings are made.

—Maine, Augusta. The Linen Manufacturing Company has recently been incorporated with capital stock of $500,000 to manufacture from flax or similar materials. C. K. Corsant, Cambridge, Mass., and John F. Wood, Boston, Mass., are president and treasurer respectively of the plant.

—Massachusetts, Millbury. Francis H. Rice has purchased the No. 1 mill and adjoining tenements of the John Rhodes Warp Mills and will put same in operation. It has not yet been definitely decided just what will be manufactured. E. C. Willey is reported as also interested. Mr. Rice formerly operated the Millbury Cotton Mill.

—Michigan, Pontiac. The Pontiac Knitting Works Company, whose plant has been shut down recently, is to be sold at public auction. The plant, of which C. E. Wakeman is president, has been operated by F. G. Jacobs and E. R. Webster, trustees.

—New Hampshire, Manchester. Louis H. Olzendam and John Reed, the latter of Boston, have been appointed temporary receivers for the A. P. Olzendam Hosiery Company. These men were subsequently appointed ancillary receivers in the U. S. circuit court in New York City. This is reported to be only a temporary embarrassment. The assets of the company are estimated at $275,000. The receivers will continue operating the plant.

—New Jersey, Malaga. Efforts are being made to establish a towel factory at this place.

—New York, Albion. It is reported that a project is under way for establishing a knitting mill at this place.

—*New York, Amsterdam. The Shuttleworth Bros. Carpet Co. is to be organized to operate the mills of Shuttleworth Bros. and McCleary, Wallin & Crouse. The company, in which W. & J. Sloan of New York are interested, proposes making extensive enlargements to both plants. H. L. Shuttleworth is president; John Shuttleworth, vice-president and W. W. Shuttleworth, secretary and treasurer.

—New York, Ogdensburg. The Oswegatchie Manufacturing Company has been incorporated recently with capital stock of $50,000. A. H. Walton, J. F. Jacobs, I. H. Lehman and J. S. Menline are the incorporators. They propose manufacturing textile fabrics.

—New York, Oneida. John L. Johnson is reported interested in a new knitting mill at this place.

—North Carolina, Shelby. Mrs. L. G. Miller has purchased the Lauraglenn Mills, recently sold to John E. Hurst. These mills are known now as the Burton Mills.

—*North Carolina, Winston-Salem. T. L. Vaughn has purchased the Twin City Knitting Mills, which have been in the hands of Col. F. H. Fries as receiver for some time. Nothing has yet been done about operating the plant.

—*Oregon, Brownsville. The Eagle Woolen Mills recently reported sold, will now be operated as the Brownsville Woolen Mill Co., Emil Koppe, superintendent. This plant has an equipment of 2 sets cards and 16 looms, and has dye house attached.

—*Pennsylvania, Churchtown. M. A. Goodhart is president of the stock company recently organized to manufacture hosiery at this place.

PERSONAL RECORD.

Cotton.

—A. G. Anger is overseer of weaving at the Cooleemee Cotton Mills, Cooleemee, N. C. He was formerly with the Proximity Mills, Greensboro, N. C.

—J. L. Asbell has accepted the position of superintendent of the Social Circle Cotton Mills, Social Circle, Ga.

—Arthur E. Benson, late with the Pierce Mfg. Co., New Bedford, Mass., has accepted the position of boss weaver with the Atlas Linen Co., Meredith, N. H.

—Clarence Bancroft of the Manchester Print Works, Manchester, N. H., severed his connection with that corporation last month. Mr. Bancroft has for several years acted as superintendent of the Print Works, and before that was chief chemist of the Manchester Mills. Henri Schaeffer, assistant superintendent, will attend to the duties of superintendent until another man can be appointed to fill the vacancy.

—Samuel Booth has been made foreman printer at the Eddystone Print Works, near Chester, Pa. Robert Reid, who formerly filled the position, has been promoted by the company to a higher position.

—W. W. Bucknell, late of Greers, S. C., is the new overseer of carding at the Belton Cotton Mills, Belton, Tex.

—Thomas H. Conley, after 18 months' service as overseer of mule spinning, cone winding, twisting and reeling at Baltic, Conn., has accepted a position with the New York Mills, New York Mills, N. Y. The help in the cone winding and twisting rooms presented him with a gold pen, and the mule spinners a gold chain and charm.

—J. K. Durst, at a meeting of the Board of Directors of the Greenwood Cotton Mill, Greenwood, S. C., held recently, was elected president of the mill. He is a brother of W. L. Hurt, deceased, former president.

—Zothique Gauthier, late of Montmorency Falls, Quebec, Can., has accepted the position of secondhand of ring spinning with the Saratoga Victory Mfg. Co., Victory Mills, Saratoga Co., N. Y.

—John Gamage of Fall River, Mass., has been engaged to take charge of the yarn business of the Samoset Company, Valley Falls, R. I., the company intending to develop its yarn business.

—I. N. Greer is the new overseer of weaving at the Kincaid Mfg. Co.'s mill, Griffin, Ga.

—John Holt, overseer of the mule room at the Warwick Mills, Centreville, R. I., resigned to take a position in the Baltic (Conn.) Mills.

—Frank W. Hicks, overseer of carding and spinning for the Tremont & Suffolk Mills, Lowell, Mass., in the woolen carding department, has accepted a position with the Davis & Furber Machine Co. Thomas Hitchcock, formerly employed at Montmorency Falls, P. Q., and Newport, N. H., mills, has succeeded him at the Tremont & Suffolk Mills.

—J. W. Hawkes has left Davidson, N. C., for Chester, S. C., where he will take charge of the spinning room at the Eureka Mills.

—Horace Hall, superintendent of the York Manufacturing Company, Saco, Me., has been presented with a gold watch and chain in commemoration of his 50 years' service with the corporation. The traveling men presented him with a handsome silver piece.

—L. B. Jones, overseer of the spinning room of the Cowan Mill, Lewiston, Me., has resigned. His help presented him with a gold watch and chain. Mr. J. Libby is his successor.

—Joseph Kershaw, superintendent of the Hart Textile Company, Woonsocket, R. I., has resigned to accept a similar position in Lowell.

—Edward Lalime, who has had charge of the spinning, warping and slashing departments in the Laurel Lake Mills, Fall River, Mass., has been appointed superintendent of the above plant, to succeed Timothy Sullivan, who has accepted a similar position with the Pocasset Manufacturing Company.

—William Landers, formerly dyer at Bondsville, Mass., has succeeded G. E. Thompson as dyer at the Clearwater Bleachery and Mfg. Co., Clearwater, S. C.

—Henry D. Martin of West Acton, Mass., is the superintendent for the Lower Mill of J. L. & T. D. Peck Co., Pittsfield, Mass. He succeeds John P. Crane. The latter has engaged with his brother, Thomas Crane, in the manufacture of crash towels at Dalton, Mass., under the firm name of Crane Bros.

—Alfred Nado, late of Taunton, Mass., has accepted the position of carder with J. J. Connell of the Richmond Spinning Co., East Lake, Tenn.

—M. N. Pool, overseer of carding at the Alpine Cotton Mill No. 2, Morganton, N. C., has resigned.

—J. D. Patton, Jefferson, Ga., has accepted the position of overseer of spinning with the Walton Cotton Mills, Monroe, Ga.

—John W. Ramsbottom, for a number of years overseer of weaving for the Slater Cotton Company, Pawtucket, R. I., has accepted the position of superintendent of the Samoset Company, Valley Falls, R. I. He succeeds the late Richard McCarthy.

—Harry Richardson, formerly of Ashton, R. I., is overseer of carding at the No. 3 mill of the Thorndike Co., West Warren, Mass., succeeding E. Billings.

—J. Blon Richards, who is to resign his place as head bookkeeper at the Arkwright Mills, Fall River, Mass., is to be succeeded by Herbert H. Marble, the present assistant, and he in turn will be succeeded by F. L. Bowers of the Border City Mills' office.

—Arthur G. Stevens, until recently with the Linwood (Mass.) Mills, has taken the position of overseer of weaving at the Peabody Cotton Mills, Newburyport, Mass.

—Joseph Smith, overseer of the white goods department of the Arnold Print Works, North Adams, Mass., has resigned. Hugh Gillies is his successor.

—C. V. Smith is to be the general manager of the Tennille Cotton Mills, Tennille, Ga., in place of J. F. Lord, resigned.

—Timothy J. Sullivan of the Laurel Lake Mill, Fall River, Mass., has resigned.

—Fred Tattersall, overseer of printing, and his son, John Tattersall, overseer of coloring, have recently resigned their respective positions with the Contrexville Mfg. Co. of Manville, R. I., and have gone to Pawtucket.

—George D. Wooley, late of the Pierce Mill, has secured the position of overseer of weaving at the Soule Mill, New Bedford, Mass.

—Thomas W. Wood, who has been overseer of carding in the Totokett Mill, Norwich, Conn., for two years and a half, has resigned to become superintendent of the Stark Mills, Manchester, N. H. He is succeeded by Mr. Boutillere of Uncasville. Mr. Wood was presented with a gold chain and charm by his help, on retiring.

—J. Miller Wilson, who has for many years been connected with the bleachery and print works at Norwich, Conn., now a part of the United States Finishing Co., has resigned as resident manager of that plant. Mr. Wilson has been obliged to give up active business owing to ill health.

—H Whitworth, overseer of bleaching and finishing at the Lanett Bleachery, West Point, Ga., has resigned.

—L. E. Wilson, formerly overseer at Westerly, R. I., is the new overseer of spool-winding at the W. Warren Thread Works, Westfield, Mass.

—Eugene Willey, formerly overseer of spinning at the Manville, R. I., Mill, has taken a position as superintendent of the Bennett Yarn Mills, New Bedford, Mass.

Woolen.

—James Bevins of New Bedford, Mass., has accepted a position as overseer of spinning in one of the wool spinning departments of the Hartford Carpet Corporation, Thompsonville, Conn.

—Martin Burke, formerly of the Faulkner Woolen Mill, Stafford Springs, Conn., is the new overseer of finishing at the Crescent Woolen Mill, Monson, Mass.

—Morris Bartell, who has been engaged for several years as boss weaver with Wm. Ayers & Sons blanket mills, Philadelphia, Pa., has recently been promoted to the position of assistant superintendent of the same mill, and his brother, Fred W. Bartell, has succeeded him as boss weaver in full charge over all the weaving department.

—Lyman A. Copeland, late of the Putnam (Conn.) Woolen Mills, is now at the Elmville Woolen Company's mill, East Killingly, Conn.

—Frank O. Clare has been engaged as loom fixer at the Dunn Worsted Mill No. 1, Woonsocket, R. I.

—J. J. Curran is the overseer of spinning at the Dayville (Conn.) Woolen Company.

—Thomas Campbell is engaged as overseer of weaving at the No. 2 mill of the Mann & Stevens Woolen Co., East Brookfield, Mass.

—Joseph Donohue of Putnam, Conn., is the new boss carder at A. Roberts & Co. mill, Claremont, N. H.

—William Duncan is the new overseer of weaving at the Agawam Co., Agawam, Mass. He was formerly at Palmer, Mass.

—J. M. Engel, boss reeler, examiner and warper for the past four months with John H. Dearnley, Philadelphia, has resigned.

—J. H. Evans, for several years boss carder and spinner with the Conshohocken (Pa.) Woolen Co., and later superintendent of the Grand Forks, N. D., woolen mills, has recently resigned the latter position and taken an interest in, as well as the management of, the Fergus Falls (Minn.) Woolen Mills.

—Daniel Fallain, formerly superintendent of the Menasha Woolen Mills, Menasha, Wis., is the new superintendent at the Madisonville Woolen Mills Co., Madisonville, Ohio.

—Harry Goodman has resigned as overseer in the chenille department of the Hartford Carpet Corporation, Thompsonville, Conn. He is to take a position with a rug and carpet company of New York.

—Lyman Hawks is succeeded by Wm. R. Marchant of Providence, R. I., as boss weaver for the Old Town, Me., Woolen Co.

—E T. Hood, formerly of the Burlington Mills, Winooski, Vt., is the new overseer of dressing at the Crescent Woolen Mill in Monson, Mass.

—Peter Hommelsheim, formerly with the Hanover Woolen Mfg. Co., at Hanover, Ill., as superintendent, has accepted the position of superintendent with W. P. Hewitt & Co., Menasha, Wis.

—Robert Latimer, late of North Vassalboro, Me., has taken charge of the Webster Woolen Company, Sabattus, Me.

—H. F. Lord, master mechanic of the Hartford Carpet Corporation, Thompsonville, Conn., has resigned.

—William J. Love succeeds F. Greenalge as overseer of finishing at the Keegan Mill, Wilsonville, Conn.

—Rufus Mackie has been appointed superintendent of the Centredale Worsted Mills at Stillwater, R. I., a branch of the worsted mills at Centredale, R. I., in place of Henry Dempsey, whose death occurred recently. Mr. Mackie is the son of W. A. Mackie, president and superintendent of the Centredale Worsted Mills. He is probably the youngest superintendent of a worsted mill in the country, being just 21 years of age.

—J. T. McNaught, formerly dyer at the Cowan Woolen Co., Lewiston, Me., and later dyer at the Assabet Mill, Maynard, Mass., is the new dyer at the S. F. Cushman & Sons mill, Monson, Mass.

—At a meeting of the Board of Directors of the Globe Woolen Company, Utica, N. Y., held recently, Walter D. Middleton was elected president and agent, and Dr. James G. Hunt was elected vice-president.

—H. W. Needham, formerly of the Golden Rod Woolen Mill, Wales, Mass., is now overseer of weaving at the branch mill of J. H. Loudon, Monson, Mass.

—Herbert A. Rowell, of Pascoag, R. I., has accepted the position of boss dyer with the Nasonville Woolen Co., Nasonville, R. I.

—J. W. Rollinson of Agawam, Mass., is now employed as boss weaver at the Warren Woolen Mills, Stafford Springs, Conn.

—John Scannell, boss weaver at Saxton's River, Vt., worsted mill for the past two years, has resigned. C. C. Harris, formerly of Ashaway Woolen Co., is the new boss spinner in this mill in place of Dan McGuire. Thomas J. Kelley, boss carder, has also resigned.

—Charles Whitehead has taken the position of overseer of weaving and dressing at the Clifton Heights (Pa.) mill of the Thomas Kent Mfg. Co.

—John Wheeler, formerly boss carder with large mills in Pennsylvania and New England, has recently accepted the position of boss carder with the Norfolk and New Brunswick Hosiery Co., New Brunswick, N. J., where he will have charge of ten sets of cards. Mr. Wheeler was for some time boss carder with this company at Norfolk, Conn.

Knit.

—M. W. Brooks, for nearly two years superintendent of the knitting mills of the Mark Manufacturing Company, sweaters and underwear, Herkimer, N. Y., resigned last month.

—Albin Benedix, boss dyer with the Van Dyke Knitting Mills, Milwaukee, Wis., for a number of years, is now boss dyer with the Commercial Knitting Mills Co., of Troy, N. Y.

—John C. Colquhoun has accepted a position with Samuel Lobsitz, Nutley, N. J., as overseer of carding, and is succeeded on night work in the carding department of Robert MacKinnon & Co.'s knitting mills, Little Falls, N. Y., by Charles H. Dorsey.

—W. E. Cahill of Herkimer, has taken charge as superintendent of the Newport Knitting Co., Newport, N. Y., taking the place of Clarence Wilkes, resigned, who has gone to Utica to assume charge of a new mill at that place.

—E. L. Holland has resigned as superintendent of the Talladega Hosiery Mills, Talladega, Ala., and will take a similar position with the new Chipman-Holton Hosiery Co. at Hamilton, Ontario, Canada.

—R. M. Kennedy of Amsterdam, N. Y., has been appointed superintendent of the No. 2 mill of the Penman Mfg. Co., Ltd., Paris, Ont. He succeeds Richard Thompson, who has been promoted assistant manager of the mills under General Manager J. B. Henderson.

—Wallace A. Low has succeeded William Baird as manager of the Lanark Knitting Co., Frankford, Pa.

—J. B. Logue, superintendent of the Racine (Wis.) Knitting Company, has resigned to take a position as manager of the Wisconsin Knitting Works, Milwaukee.

—A. J. Philbrick, after an absence in Tennessee, has resumed his position as overseer in the knitting room of Walter Aiken Sons' Mill, Franklin Falls, N. H.

—Patrick Stack, superintendent of Newland & Neilson's knitting mill, Mechanicsville, N. Y., has resigned his position to accept a similar one at Sandlake. The employees presented him with a gold watch as a token of their esteem, and Mr. Neilson made the presentation in behalf of the employees.

—Thomas Trimble, who recently resigned as superintendent of the Fuld & Hatch Knitting Mills, Albany, N. Y., is now engaged in a similar capacity at Hudson, N. Y. John Donahue is his successor at the Fuld & Hatch Mill.

—Mr. Whitman, formerly of Mechanicsville, N. Y., has succeeded James Crowe as overseer of carding for the Troy (N. Y.) Knitting Co. Mr. Crowe is the overseer of carding in the Harder Branch Mill of the Union Mills Co., Hudson, N. Y.

—Frank Wickwire of Cohoes, N. Y., is to be boss knitter for the Nutall Knitting Co. at the new mill, Rome, N. Y.

Deaths.

—James Fletcher Whitin, the youngest son of Col. Paul Whitin, who founded the great manufacturing business in Northbridge and Whitinsville, Mass., which made the family famous, died at his home in Whitinsville, at the age of 87 years, March 2. He was born in Northbridge, December 21, 1814, and was educated in the schools of the town and in academies at Uxbridge, Leicester, Monson and Amherst. On the completion of his schooling, he joined his father and his three brothers in their manufacturing business, conducted by P. Whitin & Sons, and in due time he became treasurer of the company, which was organized in 1826, taking over the business which was established in 1815. Col. Whitin died in 1831 and the firm was reorganized. The

Northbridge Cotton Mill was then bought, and was operated until 1861. A 7500-spindle stone mill was built in 1845 and in 1847 James F. Whitin was admitted as partner in the business. In 1848 the Uxbridge Cotton Mill was acquired, 10,000 spindles, and it was operated until 1864. In that year the joint business was divided, John C. Whitin taking the machinery business, James F. Whitin the Uxbridge Cotton Mills, Charles P. Whitin the Whitinsville Cotton Mills, and Paul Whitin the Rockdale Mills. In 1866 James F. and his brother Charles P. built the Linwood Mill and operated it under the name of Whitin Bros. It had a capacity of 15,000 spindles. Mr. Whitin retired from active business about 12 years ago. He married in 1842 Miss Patience H. Saunders, and five children were born to them, only one living today, Albert H. Whitin of Linwood. His widow and four grandchildren survive him. Mr. Whitin was a public spirited man, being identified with many local banking, social, educational, and religious institutions.

—Edward D. Holden, agent of the Sterling Woolen Mills, Lowell, Mass., died March 18, at the Lowell General Hospital. He had been president of the Lowell General Hospital Association and had held numerous positions of trust in the community. He was born in West Concord, N. H., July 11, 1848, and came to Lowell in 1871. He leaves a widow.

—William Skinner, a well-known silk manufacturer of Holyoke, Mass., died recently. He was born in England in 1824, his father being a dyer in charge of a dyehouse in London. After he had received his early schooling he went to work for his father to learn the dyeing business. The dyehouse was owned by a man named Valentine, who had a son who came to Florence, Mass., to start a dyeing establishment. He soon sent to England for a foreman to take charge of his place at Florence, and young Skinner was sent over. Valentine failed after a time, and Mr. Skinner took the dyehouse to satisfy a claim. For several years he ran the dyehouse, dyeing the silk used for a number of small mills in Connecticut. About 1848, with Joseph Warner of Northampton, he began to make sewing silk, and the two had charge of a large plant. The partnership with Mr. Warner was short, and Mr. Skinner next bought land and built a mill between Haydenville and Williamsburg, later known as Skinnerville. The great flood of 1874 completely wrecked the little hamlet, with its one industry. The Holyoke Water Power Company gave him a large lot, on which he built a mill, which has since been repeatedly enlarged, and about 1896 a second mill building was erected. The name of the firm was changed in 1883 to William Skinner & Sons, and later to the William Skinner Manufacturing Company. He was a director in the West End Street Railway Company, of Boston, president of the People's Savings Bank and vice-president of the Hadley Falls National Bank, among other offices of trust. Mr. Skinner gave largely to charitable and benevolent objects. In Holyoke to every public institution he had been a liberal giver, and the name of William Skinner has been attached to many other good works.

—John H. Peet, well known in the wholesale dry goods market, died at his residence in East Orange, N. J. Mr. Peet was born at Canaan, Conn., in 1828. He was educated in Great Barrington, Mass., and his first business experience was gained at Pittsfield, Mass. In 1833 he came to New York, and for some years was connected in an official capacity with the New York custom house. He was also employed by the firm of Lawrence, Clapp & Co., and in 1866 established the house of Whittemore, Peet, Post & Co. At the time of his death he was the sole surviving partner of this concern. During the past 25 years he had been one of the trustees of the Citizens' Savings Bank of New York.

—James R. Doudge, for many years one of New York's most prominent wool merchants, died at his home, No. 33 West 49th St., March 11. He was born in Brooklyn, N. Y., in 1851, and began as an entry clerk with Collins, Downing & Co., cloth jobbers. He left this firm after five years' service, and worked with various firms in the trade until he entered into a special partnership with Oelbermann, Dommerich & Co., retaining the management until incapacitated by ill health. Mr. Doudge was president of the Valley Worsted Co., of Providence, treasurer of the Fitchburg Worsted Co., a director in the International Trust Co., of Boston, a stockholder in the American Woolen Co., and a member of the Chamber of Commerce. With James Phillips, Jr., of Boston, and several other business men, Mr. Doudge founded the New York "Press." He leaves a widow, one son and two daughters.

—John T. Hand, of New York City, died at the Saratoga Club in Saratoga, N. Y. He was born in Albany, in 1845, and began his business experience in this city with the commission house of Stanfield, Wentworth & Co. Subsequently he became connected with the firm of M. W. Cooper & Co. When this firm went out of existence he was made a partner in the concern of Walkinshaw & Voigt. This firm also dissolved and Mr. Hand took the woolen accounts under his control to the commission firm of Gowing, Sawyer & Co., now Sawyer & Blake. He maintained his relations with this house until 1894, when he was stricken with paralysis. Since that time he has been incapacitated for business and has lived mostly at Saratoga.

—Arthur A. Maginnis, president of the Maginnis Cotton Mills, New Orleans, La., died recently at the Waldorf-Astoria, N. Y. He was also president of the Planters' Fertilizer Co., and was a member of the Lafayette Warehouse Company, the New Orleans Cotton Exchange and a number of carnival organizations.

—Hon. Ira G. Briggs, for many years a prominent cotton manufacturer in Connecticut and Rhode Island, died at his home in Voluntown, Conn., at the age of eighty-one. He was connected with cotton mills in Hopkinton, Beachdale, and the mills at Voluntown now operated by the Briggs Mfg. Co.

—Robert J. Stinson, a member of the firm of Stinson Brothers, carpet manufacturers in Kensington, Philadelphia, died last month. His death was the result of a stroke of paralysis. Besides a widow, he is survived by a son, Robert M. Stinson, who is connected with his father's business, and a daughter.

QUESTIONS AND ANSWERS

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Drying Raw Stock.

Editor Textile World:

What is the best method for drying say 500 lbs. of cotton waste per day? Is drying in the open air an economical method?

Trocken (216).

For such a small quantity of stock, the flat dryers heated by steam will prove the most economical. Drying out of doors is expensive as regards labor, and very unreliable. Stormy weather interferes frequently with the work, and after a storm it takes considerable time for the drying board or platform to dry out. For larger quantities of stock the machine dryers are most serviceable and much superior as regards quality and cost of work to any other process.

Warp Dyeing.

Editor Textile World:

What books can you recommend treating of the subject of warp dyeing?

Denim (221).

The three following works on dyeing treat incidentally of warp dyeing:—Knecht, Rawson & Loewenthal, Manual of Dyeing, 3 vols. $15.00; Hummel, Dyeing of Textile Fabrics, 1 vol., $1.75; Beech, The Dyeing of Cotton Fabrics, including yarn, 1 vol., price $3.00 net. The last named is the latest work published, but we can recommend either of the other two, and consider Beech's work a very good manual of cotton dyeing.

Mercerizing Cotton.

Editor Textile World:

How can I get information in regard to mercerizing cotton? Are there any books upon the subject?

Atlantic (223).

Since the improvements in mercerizing, the Textile World has published a great many articles on mercerizing, probably more than any other journal printed in English.

The only book known to us treating of the mercerization of cotton is Gardner, Mercerisation der Baumwolle. Price $3.00. The text is in German. In our March issue appeared a translation of one chapter of this work, which gave a general description of the process, and contained an unusually large amount of information on the subject. In the same issue there was published a Question and Answer in regard to the twist that yarn intended for mercerizing should contain, and giving the practice in one of the best mills in the United States.

Worsted Yarns.

Editor Textile World:

Please send us the names of all the manufacturers of worsted yarns. If you are not able to do so, could you inform us where we could get same?

Astrakan.

On page 397 of our Annual Directory is a list of worsted yarn spinners, classified according to kind of yarn spun, and on pages 449 and 450 are all the mills in the United States with worsted machinery, whether they spin for the market or not.

Cuffs on Men's Union Suits.

Editor Textile World:

We would like your advice on the matter of securing an improved cuff at the ankle and wrist of men's union suits knit on latch needle machines. We have been favorably impressed with the idea of having a separate knit cuff made on a Lamb machine and joining same onto our suits knit on latch needles; however, the question with us is how to neatly and securely join the two pieces of knit cloth in order to secure proper elasticity.

We are enclosing you a knit cuff which we are at present using and which is only satisfactory on heavyweight garments, but find same to be very unsatisfactory on summer weight suits because of the cuff stretching out and becoming very loose. We shall be pleased to have you advise us on these matters.

Union (229).

In another part of this issue will be found the opinions of several practical men upon this question.

Irregular Lengths of Union Suits.

Editor Textile World:

We are producing a line of men's union suits knit on latch needle machines, and are experiencing considerable trouble in

our cotton knit cloth because of our garments coming out irregular lengths. Our worsted knit cloth is all washed and shrunk before being cut; in the case of our cotton knit cloth, we have been allowing same to lay several days after being taken off the machines, or making an allowance for shrinkage in the body and inseam; however, we have found this manner of allowing for shrinkage very troublesome in cotton goods, and what we desire to ascertain is whether you can put us in correspondence with the manufacturers of machines that will shrink cotton cloth in the web without taking the gloss off of the knit cloth? We have been advised to use a hot and cold process, but would like to have you advise us on this point, that we may, if possible, secure some process of properly shrinking cotton cloth before it is cut.

Aztec (228).

In another part of this issue will be found the opinions of several practical knitters in regard to the difficulty which Aztec is having.

Holes in Knit Goods.

Editor Textile World:

We are having trouble with our knitting machines cutting holes. We enclose a sample of the No. 10 cotton yarn we are using. Our machines are 14 inches in diameter, and run 58 to 60 turns per minute; the yarn is knit tight. Can you suggest a remedy for the difficulty?

Selden (224).

We have submitted a sample of this yarn with the details of the trouble as given by Selden to two practical knitters. Following are their replies:—

1. If the machine is built right, this yarn should run well. It it not possible to speak definitely regarding the cause of the holes without seeing a piece of the fabric that the holes are in, and even then, it would be difficult to name the cause, as there are so many things that will cause holes, and it is generally several little things combined.

In the first place, the fixer should see that the yarn is wound perfectly, and that the winder ties flat knots. He should also see that each winder has a number or mark put on each bobbin wound, and, in putting a set of bobbins on the frame, he should see that the full set is wound by the same winder, so that in case of any bad work it can be easily traced back to the winder that did it. After the yarn is put on the frame, see that the bobbins are in line so that the yarn will come off the bobbins perfectly free; also see that everything that the yarn passes over on its way from the bobbin to the needles is perfectly smooth; do not have any more tension on the yarn than you can possibly help. If you are using stop motions, run the yarn direct from the stop motion to the guides, and not down through the carriers and over to the guides, as this adds tension to the yarn, and, consequently, helps to make holes. Next see that the guides are set back far enough from the needles so that there will be no danger of the yarn getting bound between the needles and the guide. Next see that the dial cap is adjusted properly; this should be set so that the cylinder needle draws down so as to lay the yarn just back of the rivet of the dial needle. Now see that the dial needles draw back far enough to be sure of casting off the stitch. This is a very important part of the adjustment, as either too much or too little will cause holes. The next and most important thing is the take-up. A good, even, steady take-up is half the battle in overcoming holes. If the take-up works tight, then slack, it is next to impossible to get good work. If you are making shaped work, a good way to tell how even the take-up is working is by measuring the lengths, any variation in which will mean a variation in the take-up.

In conclusion, will say, get the take-up just as slack as you can, without having the machine load up, then see that the dial needles are casting off the stitch good and clear, and go ahead.

Badger.

2. As far as I can judge the yarn is not so much at fault, as the fact that they have the machine speeded too high. In my opinion, if they take off about one-fourth the number of revolutions per minute, with the machine properly adjusted it will run O. K., judging from the sample sent, and taking into consideration the fact that yarn will untwist after laying or handling, especially if it lacks twist in the first place. I trust this suggestion will help them, as it has me in times past. To be sure, there are several things in the adjustment of machines to overcome holes, but I am confident they have the machine speeded too high.

Royal.

Yarnometer.

Editor Textile World:

Will you inform us who makes the Mark Thompkins Yarnometer?

H. E. (227).

We are not familiar with this type of yarn measuring machine. It is probably of English make, and if any of our readers are familiar with it, should be glad to know by whom it is made, and if it can be procured in this country.

New Publications.

Chemical Manipulation of Wool; by Victor Joclet; new edition revised by W. Baenker; St. Hartleben, Wien.

The popularity of this book has necessitated the issuing of a new edition. Owing to the death of the author, the work of revision has been intrusted to W. Baenker, a practical dyer and chemist, who has brought the work up to date in line with the latest improvements and researches. Following is an abstract of the table of contents and shows the comprehensive way in which the subject is treated: Mordants and auxiliary chemicals; Natural dyes; Artificial dyes; Dyes in neutral baths; Dyes in weak acid baths; Dyes in acid baths; Materials that possess the characteristics of both dyes and mordants; Indigo; Wool scouring; Yarn scouring; Scouring piece goods; Carbonizing; Bleaching; Dyeing loose wool, tops, yarn and pieces; Logwood; Testing colors.

The work, which is in German, is illustrated and can be ordered at this office.

The Metric System of Weights and Measures, by G. Bigourdan; Gauthier-Villars, Paris; price $2.25.

A book of absorbing interest, tracing, as it does, the development of the metric system from its first inception to the present time. The reader is carried back to the time of the French Revolution, and follows the scientists of that day in their work of establishing a system of weights and measures, not only for France, but a system that they hoped would eventually become world wide. The various plans proposed for such a system are described; the part played by political forces is revealed; an interesting account is given of the slow, difficult and hazardous work of surveying a portion of the earth's meridian to determine the size and shape of the world; the intricate operations necessary for measuring the standards when finally determined; the opposition to the innovation encountered both at home and abroad; the gradual adoption of the new system; all these points are dealt with in language so clear that this scientific story is made plain even to those not versed in the higher branches of mathematics. It is a work that will be welcomed by many in the United States at the present time, when an earnest effort is being made to introduce the metric system into this country. It presents in attractive form a vast fund of information that could be obtained elsewhere only by long, patient and laborious research. The author is an astronomer connected with the royal observatory at Paris, and thus had at his disposal in writing this book unexcelled facilities for doing the work well. It is written in the French language and illustrated with maps, portraits of scientists, illustrations of apparatus, etc.

Law Relating to Factories and Workshops; by William Bowstead; Sweet & Maxwell, London, England. This is a compilation of the law relating to factories and workshops as amended by the Act of 1901.

A Treatise on Machinery for Weaving Schools, by Karl Mikolaschek; Franz Deuticke, Vienna and Leipzig; illustrated; price 75 cents.

This work is intended for a text book in textile schools. Its scope and contents are shown by the following abstract of the table of contents: Machine Parts in General; Fastening Parts; Bearings; Power Transmission; Cranks, Eccentrics, etc.; Clutches; Power Transmission by Water Pressure, Compressed Air and Electricity.

The work is written in German.

Flyers, by Theobald Demuth; Paul Sollors, Reichenberg; price $1.00.

The work treats of fly frames and is adapted for German textile schools. It contains numerous illustrations, and is divided into six sections as follows: General description of fly frames; Calculations; Improved Differential Motions; The German Flyer; The Platt Flyer; The Brooks and Doxey Fine Flyer. The text is in the German language.

The Raw Materials of the Vegetable Kingdom, by Dr. Julius Wiesner; Wilhelm Engelmann, Leipzig.

We have received the latest part of this important German work. In our notice of the earlier issues the plan of the work was described in detail. The part just issued begins with jute and treats successively of sisal, Mauritius hemp, New Zealand flax, aloe fibre, coco fibre, peat, paper fibre, straw, wood and roots. Numerous illustrations add to the interest and value of the German text.

Engineering Practice and Theory, for Steam Engineers; by W. H. Wakeman; published by the author. "The proof of the pudding is in the eating of it." Engineering Practice and Theory has been subjected to this test with most satisfactory results, and has been sold in 44 states and proved so popular that a second edition has just been published. It cannot fail to be of great value to those having to do with steam engines and boilers. It possesses the advantage of being issued in a portable size adapted for use in the workshop and engine room, and having the information it contains presented in concise, clear language adapted for the conception of the ordinary everyday workman and engineer.

History of the Development of Lace; by Dr. M. Dreger; Anton Schroll, Vienna.

This is the first of a proposed series of works on art and industry, to be written with particular reference to the art collection in the Royal Austrian Museum for Art and Industry at Vienna. This volume is divided into three sections: Early History; Italian Lace; The Northern Lace. The illustrations are numerous, of a high grade of workmanship, and the work, which is in German, is evidently compiled with great care and by one who has given long and patient study to the subject.

Preventing the Pollution of Water, A Treatise on the German Statutes; by Dr. L. Holz; Carl Heymann, Berlin.

This is a concise commentary on the German statutes enacted for the purpose of maintaining the purity of water. It contains extracts from the principal acts, together with comments by the author upon these provisions, and is issued with the sanction of the German government. The work is in German and can be ordered through this office.

Commercial French, by Poole and Becker; John Murray, London; 2 vols.; price $2.00.

This is a course of lessons designed for teaching commercial French by the natural or direct method. It is intended for use in commercial schools and classes. While the use of the direct method of language teaching is being rapidly extended, it is in such schools and classes that its advantages are greatest, since it gives the pupil a practical working knowledge of a foreign tongue much quicker than by the old system of instruction. This work will also prove useful for self instruction in French. It can be ordered through this office.

Business Literature.

The Degreasing of Wool and Scouring of Wool; by Paul Malard. A booklet in which are stated the advantages of the Malard system of degreasing and washing wool, a process that has been extensively adopted in France, and particularly in the Raubaix district. The text is in French.

Knitting School, Limbach, Saxony; Program of Exercises on March 21 and 22, 1902. Prof. Willkomm, Director. This pamphlet contains an introduction by Prof. Willkomm, in which he reviews the development of the knitting industry in Germany during the past year. Then follow the rules and regulations of the school, tuition, courses and list of students.

Hand-Book of the American Society of Dyers, 502 North Sixth Street, Philadelphia, Pa. We have received a copy of the official hand-book of this association beginning with a brief history of the society itself. It also contains a copy of the constitution and by-laws, and a list of the leading chemicals used in dyeing, also many useful tables and articles. The society has for its object to better the condition of the art of dyeing, and to afford an opportunity for dyers to become better acquainted with each other and each other's methods. It deserves the encouragement of all.

Bulletin of the National Association of Wool Manufacturers, March, 1902. The first article in this issue is by Samuel W. Stratton, entitled "The National Bureau of Standards." It is followed by the Methods and Results of Textile Education; Proceedings of the Thirty-seventh Annual Meeting of the Association; Annual Report of the Secretary; Obituary Notices; Miscellany. The frontispiece is a portrait of the late Mr. Robert Middleton.

Tanks, Towers and Tubs; The W. C. Caldwell Company, Louisville, Ky., have issued a descriptive catalogue of the various types of tanks, towers, tubs, etc., built by them. In addition to the illustrations and descriptive matter, there are numerous useful tables giving the capacity of the different sizes of tanks.

Watchmen's Clocks; Rigg & Brother, 310 Market St., Philadelphia, Pa., have sent us a descriptive circular of the various styles of watchmen's clocks made by them for the different requirements of mills and workshops. A copy will be mailed upon application.

Tanks. We call the attention of our readers to the superior facilities afforded by D. B. Stevens & Co., Auburn, Me., for building tanks of all sizes, and adapted for any purpose. They are prepared to furnish promptly, tanks made of white pine, cypress, cedar or yellow pine, and equipped with patent draw lugs for the hoops. This firm was established in 1893, and since that date have built up an enviable trade by reason of the superior workmanship of their tanks, and the low price which their superior facilities enables them to make to the trade.

New Color Cards.

Farbenfabriken of Elberfeld Co., New York. Katigen Brown V extra. This card shows four samples of cotton yarn dyed various shades of brown with Katigen Brown V extra.

Farbenfabriken of Elberfeld Co., New York. Diazo Rubine B. This card shows two samples of piece goods dyed with Diazo Rubine B developed with Developer A.

Calendars Received.

W. B. Smith Whaley & Co., have sent us a calendar for 1902, on which appear illustrations of the interior and exterior of the Olympia Cotton Mills, which were built after plans furnished by this firm.

We have received from the American Supply Co., Providence, R. I., a copy of their 1902 diary published in pocket size, and containing much useful information in addition to the diary pages.

Helped in his Business.

Washington, Ga.

Textile World:-

Gentlemen:-

As I have sold my mill, would ask that you stop sending me the Textile World when my subscription expires.

I am sorry that I will not have any further use for the same, although it has been of great service to me, as I knew nothing about the knit goods business. By information gathered from your journal, I learned to build a bleachery and bleach my own goods without any other information whatever, and without ever seeing a bleachery.

My mill was sold to Mr. Ben Russell by a small notice in your journal that he was contemplating erecting a knitting mill at Alexander City, Ala.

I quit the business on account of bad health, not being able to look after it.

(Signed) R. A. Almand.

The Home Bleach & Dye Works.

To keep pace with increasing orders for bleached and dyed yarns, the Home Bleach & Dye Works, Pawtucket, R. I., of which Mr. Peter B. McManus is proprietor, are now installing a new boiling kelr and a 42-inch Broadbent hydro-extractor. They are making a specialty of fast colors for the worsted trade, and

have been obliged to run part of their plant overtime of late to keep up with their work.

C. Bischoff & Co. Open a Chicago Office.

In addition to the Providence and Montreal branches, recently opened, the enterprising firm of C. Bischoff & Co., importers of dyestuffs and chemicals, have opened a branch in Chicago at 196 Michigan St., which will be in charge of a competent staff, and enable them to attend to their trade in this section at short range.

Dust Collectors.

The Sterling Blower & Pipe Mfg. Co., Hartford, Conn., have received the following letter:

Boston, Mass., Jan. 9th, 1902.
Sterling Blower & Pipe Mfg. Co., Hartford, Conn.

Dear Sirs:—My attention was first called to the Cyclone dust collector many years ago in Minneapolis, in the flour mills. I at once witnessed its probable usefulness in the picker rooms, and in other dusty parts of our textile factories, where it has been gradually introduced, with very excellent results.

Yours very truly,
Edwd. Atkinson,
President Boston Manufacturers Mutual Fire Insurance Co.

The Sterling dust collecting system has been adopted in many textile mills with very satisfactory results. This company invites correspondence, and guarantees results.

Selling Agent on the Pacific Coast.

Mills selling their own goods, seldom have an organization that covers the Pacific Coast, and it may be of interest to them, especially to hosiery and underwear manufacturers, to know that W. T. Price, 222 Sutter Ave., San Francisco, acts as manufacturers' selling agent for the Pacific Coast for hosiery, underwear, woolen and cotton piece goods. Since the acquisition of our Oriental and island possessions, he has made connections with the Orient and Pacific Islands and in this connection might be of some assistance to manufacturers seeking to extend their trade in the Philippines and China.

Houghton Steel Thread Board.

We continue to hear of the success that this all steel thread board is meeting with. The Golden Belt Mfg. Co., Durham, N. C., have, after a careful trial, ordered this steel thread board on the new frames that are now being built for their addition. The frames in the new mill of the Whitman Co. also have the Houghton steel thread boards specified. Several large mills which have been trying the boards, report favorably on them, and will probably equip their frames with same. An interesting experiment was recently tried in Woonsocket, showing the value of having the thread guides accurately adjusted. Some very poor roving, so poor that it broke in spinning, was tried on spindles equipped with steel boards, with the result that two doffings were spun on four spindles, with only one broken end, while with the old wooden board and guides, the roving would not be spun at all. The Fall River Machine Co., Fall River, Mass., are now using them exclusively on their frames. L. T. Houghton, of Worcester, Mass., is the sole manufacturer.

Free Scholarship at the New Bedford Textile School.

Applications for the Firth scholarship at the New Bedford Textile School should be made by letter only, addressed to the New England Cotton Manufacturers' Association, Box 3672, Boston, Mass. The candidates must be at least fourteen years of age and furnish certificates of good moral character, and those who have been students of other technical institutions, colleges or universities will be required to furnish certificates of honorable dismissal from such institutions.

Those applicants conforming to the above conditions will be nominated by the Board of Government to the New Bedford Textile School, and the selection of the candidate for the scholarship will be made as the result of an examination to be held in the lecture hall of the School at New Bedford, Mass., on Friday, September 12, 1902, at 10 a. m., or such other date as the Managing Director of the School may notify the candidates.

Any information not provided for in this circular, or conditions of enrollment not previously referred to, will follow the conditions as specified in the official catalogue of the New Bedford Textile School; which may be obtained on application to the Managing Director, New Bedford Textile School, New Bedford, Mass.

The Philadelphia Textile School.

The loan exhibition of textile fabrics, rugs, laces and appliances used in producing the same prior to the advent of the modern power loom, which is being held at the Philadelphia Textile School, is attracting much attention. Several features of the exhibition are well worthy of mention. Among the display is a portion of the well known collection of Mr. Denman Ross of Boston, Mass. These fabrics are products of the earlier masters from the 15th to 18th centuries, and were all made prior to the invention of the Jacquard loom.

To the student of textiles this collection has particular interest, not only in design and color, but in the fabrication of such high class stuffs as were made at a time when everything depended entirely upon the skill of the operator. Some very beautiful specimens of Italian manufacture are shown, as well as Saracenic, all of which goes to prove that the progress which has been made in modern weaving viewed from an artistic point, may not be regarded as either very material or noteworthy, but, in the development of mechanical processes for the rapid production of woven fabrics, the advance within the past century has been simply marvelous.

In conjunction with the opening of this exhibition on February 26th, a students'

working exhibition was held, at which time all the carding, spinning, weaving and dyeing machinery were in full operation. The proximity of the exhibition hall to the working laboratories of the school made it possible for even the uninitiated to comprehend the wonderful progress made on the side of mechanical invention. The great variety of fabrics which were being produced by the students of the school on the power looms, ranging from simple muslin to the most complicated silk brocade, reflected great credit on the ability of the instructors in charge of the various departments.

In connection with this exhibition, which was open to the public from 10 to 6 daily until March 26th, there was also given a series of lectures as follows: March 5th, "Colonial Relics," by Mrs. Frishmuth; March 12th, "Tapestries," by Charles E. Dana; March 19th, "Anatomy of Art," by Dr. George McClellan.

Down Draft Forges.

The Buffalo Forge Co., Buffalo, N. Y., have received the following interesting testimonial from the "Big Four Route" Railroad Company, referring to their down draft forges.

November 27, 1901.

Buffalo Forge Co., Buffalo, N. Y.

Gentlemen:—Replying to your inquiry in regard to the performance of the down draft forges designed and furnished for our blacksmith shop at Wabash. These forges were purchased and placed in service in 1895, and since that time they have given satisfactory performance.

We consider the down draft system an excellent one, first, on account of the thoroughness in removing smoke from the shop, and second, on account of not requiring overhead pipe or other obstructions to interfere with or prevent the handling of heavy work with cranes, etc.

Yours truly,

W. GARSTANG,

Supt. of Motive Power "Big Four Route" Railroad.

—The Howard & Bullough, American Machine Company, Ltd., Pawtucket, R. I., have recently received the following orders:—

The Mechanics Mills, Fall River, Mass., placed an additional repeat order for their latest pattern slubbing, intermediate and roving frames; the Adelaide Mills, Anniston, Ala., a repeat order for card room and spinning machinery; the Lorraine Mfg. Co., Westerly R. I., placed an order for revolving flat cards; the Graniteville Mfg. Co., Graniteville, S. C., placed a repeat order for roving frames and spinning frames; the West Boylston Mfg. Co., Easthampton, Mass., a number of roving frames; the Dartmouth Mfg. Corporation, New Bedford, Mass., are now receiving shipments of picking cards, drawing and speeders; the Dillon Cotton Mills, Dillon, S. C., are now erecting card room and spinning machinery recently ordered by them; Thomas Henry & Son, Philadelphia, Pa., placed a repeat order for roving frames; the Central Mills, Sylacauga, Ala., recently placed a large repeat order for speeders; the Adelaide Mills, Anniston, Ala., are receiving shipments of their recent order for revolving flat cards, roving and spinning frames.

A General Repair Shop.

The American Ferrofix Company have just erected a large shop at 74 Hudson St., Jersey City, and this will be followed by others in different parts of the country. They are prepared to do all kinds of repairs, the brazing of castings being a specialty. All work is done at shop rates; no charge is made if results are not perfectly satisfactory.

Textile Finishing Machine.

There has recently been erected at the Atlanta Rug Mills a shearing machine to finish twelve feet wide rugs lengthwise, the joint invention of Joseph Hawley, superintendent of the Atlanta Mill, and Geo. C. Howard of Howard Foundry & Machine Works, of Lansdowne, Pa. The work was done previously on a crop cut shear, costing much more. Mr. Howard is an expert of fifty years' experience. His two-side shears for ingrain carpets, print goods and other textiles are in ust in many mills, and as a manufacturer says the combined rolling and shearing machines have a world-wide reputation.

Cigars.

F. W. Taylor, formerly Taylor & Stinson, whose advertisement appears regularly in the Textile World, has removed his office to a more central location at 14 South Fourth St., Philadelphia, where he will be pleased to receive his friends and customers. Mr. Taylor issues a complete price-list of all the popular brands of Key West and imported cigars, as well as those of his own manufacture, which we will gladly mail upon request. If undecided about the cigars you want to order, would-be purchasers can avail themselves of Mr. Taylor's judgment in selecting a brand for trial.

—The Burt Mfg. Co., of Akron, Ohio, have issued two very neat little booklets describing their Cross Oil Filter and the Burt Exhaust Head, copies of which will be mailed to anyone upon application. It may be mentioned here that the Cross Oil Filter was awarded the highest medal at the Pan-American exposition and that its sale has extended to 28 different countries, while nine governments have adopted it for their navies, arsenals, etc.

—The Lorraine Mfg. Co., after a year's use of the Green Economizer have considered its importance to be such that they have contracted for its installation at their worsted plant in Pawtucket, and their branch in Westerly. Mr. H. G. Brinckerhoff, the Boston representative of the Green Fuel Economizer, says: "This kind of a testimonial, while not uncommon with us, is always exceedingly gratifying."

—H. G. McKerrow, 31 State Street, Boston, Mass., recently shipped some Tweedales & Smalley jack frames to the St. Croix Cotton Mills, Milltown, N. B., and a car load of Tweedales & Smalley card room machinery to the Robeson Mills, Fall River, Mass.

—The Peace Dale Mfg. Co., Peace Dale, R. I., have placed a contract for the Green Economizer. This is their fourth order for these machines, their first coming from England in 1873.

Amalgamation of Correspondence Schools.

An important consolidation of institutions for correspondence education has recently been effected by which the American Correspondence School of Textiles has become amalgamated with the International Correspondence Schools of Scranton, Pa., under the proprietorship of the International Textbook Company, T. J. Foster, president.

The American Correspondence School of Textiles, established four years ago by Prof. C. P. Brooks and conducted by him in New Bedford, Mass., has had a rapid and wonderful growth. Its students are numbered by thousands, residing not only in the United States but all over the world wherever textile manufacturing is carried on and there is certainly not a manufacturing town in the United States, and hardly a mill in the country but has one or more students taking courses of correspondence instruction from this school. Prof. Brooks also has charge of the New Bedford Textile School, an institution for residential textile education, of which he is managing director, and to which an annex has recently been added, almost doubling the size of the school, and in which it is intended to install departments of chemistry, bleaching, dying, knitting, art and languages in addition to the present departments of carding, spinning, weaving and designing; his consultative and expert work on textiles has also been rapidly increasing, and the consolidation referred to has been necessitated in order that he might be relieved of the details of business management of the correspondence schools.

The instruction of the students, however, will still be continued from New Bedford, Mass., and with the aid of the large staff of expert instructors that has been organized during the last few years, insuring to the student a continuation of the high class of textile instruction which has always been a feature of the American Correspondence School of Textiles. It is safe to say that with the aid of the immense organization of the International Correspondence Schools and of the great resources of the International Textbook Company, which has a capitalization of $3,000,000, and nearly 400,000 students, that the growth of the textile correspondence education will be far more rapid in the future even than it has been in the past.

Prospective students and those already enrolled should bear in mind that the instruction in textiles will be given solely from New Bedford, Mass., although information can be obtained and enrollments made, after April 1st, at any of the branch offices of the International correspondence schools, or through any of their representatives, who are to be found in every manufacturing centre in the United States.

Information and circulars may be obtained at any time from the International Correspondence Schools of Scranton, Pa., or at any of their branch offices, or from the New Bedford School, which will now be known as the International Correspondence School, Textile Department, New Bedford, Mass. C. P. Brooks, Principal.

—The Benedict and Burnham Mfg. Co., Waterbury, Conn., have ordered the Green Economizer in connection with 4000 H. P. boilers which are planned to be installed in their new boiler house.

R. B. Denny.

The Bar Mills, West Buxton, Me., containing two sets of woolen cards, have been leased for a term of years by Martin & Marble. Fancy cassimeres will be manufactured, and operations are to be begun at once. The lease was negotiated through the well known agent for mill property, R. B. Denny, 143 Federal St., Boston.

Finishing Dyeing and Printing.

The Arabol Mfg. Co., 155 William St., New York, make a specialty of soluble oils, alizarine assistants, Turkey red oils of different percentage for use in finishing, dyeing, printing, etc. They are experts in the use of size in textile manufacturing, and their goods have attained an enviable reputation.

Seaboard Air Line Railway.

With its superb trains, the Florida & Metropolitan Limited and the Seaboard Fast Mail, offers to the patrons of its line, magnificent train service every day in the year. This line, with its northern terminus at Washington, passes through a delightful section of Virginia, thence through the sand hill sections of North and South Carolina, into both Atlanta, Ga., and Jacksonville, Fla., offering locations for homes, manufactories, stock-raising and other branches of industries not to be secured on any other line in the South. Its mileage tickets, which are sold at $25.00 per thousand miles, are good from Washington to any point on its lines, thereby enabling its patrons to visit such points at a very low cost. In addition to these cheap rates, it offers to prospectors and home-seekers, tickets at greatly reduced rates, which can be had on application to any of its representatives.

This line, with its many delightful resorts, is truly a line of winter homes for northern tourists.

For illustrated literature and all other particulars, call on or write T. H. Pleasants, Traffic Manager, Portsmouth, Va.; R. E. L. Bunch, General Passenger Agent; J. C. Horton, E. P. A., 1183 Broadway, New York.

An Interesting Ad.

Manufacturers of knit goods, or those contemplating engaging in that business, will find the advertisement on another page addressed to manufacturers of knitted sweaters and signed "King," a rather interesting proposition.

Removal.

To secure larger accommodations to facilitate his increasing business, W. B. Guild will have his office hereafter at 79 Milk Street, Boston. This location is opposite the post office, and he will be pleased to see his friends there.

Improved Drying Capacity.

Some months ago, we mentioned several interesting cases of the application of the Berry wheel and system of drying to upright Heathcote dryers. Since that time a number of new installations have been made with remarkable success. Mr. Berry claims to give an increased capacity of only 20 to 25 per cent., but in some cases manufacturers report an increase of 40 per cent., and even doubled capacity. The Berry wheel and drying system has been equally successful when applied to carbonizing plants. The manufacturer, A. Hun Berry, 23 West First St., Boston, is very busy at the present time filling orders for the textile trade. Besides this, he has been building some 4 ft. and 6 ft. fans for drying leather boards.

Collapse of a Flax-Spinning Mill at Belfast.

A disaster similar to the falling of the Pemberton Mill in Lowell, Mass., over forty years ago, occurred last month in Belfast, Ireland, when a portion of an old-established spinning concern, known as the Smithfield Flax-Spinning Mill, collapsed. The mill employed about 600 hands, principally women and girls.

Just after the breakfast recess, when all had resumed work, a terrific crash was heard throughout the building. A portion of the outside wall fronting Royal Avenue had collapsed, bringing down the intervening floors from roof to basement. The accident occurred so suddenly that there was no time for the escape of the operatives, with the unhappy result that a large number of them, mostly women and girls, were embedded in the debris.

The only possible explanation of the mishap suggesting itself to the manager, Mr. Prince, is that one of the iron supports on the first floor gave way. The structure is a four-storied one, and very old. The ground and first floors were utilized as a flax-preparing department, the second and third being occupied by spinners, and the fourth by reelers, some 400 people being engaged in these departments.

Some exceedingly heavy machinery was fixed on the higher floors, and this, together with the solid brick and concrete flooring, fell in a joint mass which carried all before it. The gap in the outside wall which originally gave way measured about 20 feet, and fully this length of wall fell through all the floors of the departments.

A scene of indescribable confusion ensued, and for a time the exact number of individuals affected could not be surmised. Communication was promptly set up with the Ambulance Department of the City Fire Brigade, with the police, and with the authorities of the Royal Victoria Hospital, and shortly the full ambulance corps, supplemented by numerous volunteers, were at work rescuing those entombed in the ruins.

Out of many touching scenes perhaps the most pathetic is that of a girl who had been out of work for some time, and was in the act of receiving an engagement when the accident took place, a pile of flooring falling upon her and crushing her to death.

A boy named Foote was so tightly wedged in that only after considerable difficulty were his head and shoulders cleared, when stimulants were administered him. The poor child cried piteously, but it was quite an hour before the lower portion of his body could be freed. Meanwhile heavy masses of masonry were falling, and it seemed at times as if not only he but his rescuers would be buried. Eventually he was extricated in a terribly mangled condition.

Twelve bodies were found in the ruins, and a large number were injured. Several deaths have occurred since as a result of injuries.

Notes from Western Mills.

At St. Joseph are located the mills of the Buell Mfg. Co., and a busy concern it is, too, having booked orders for fall shipment of 100,000 pairs of their blankets, not including robes; besides this, they now have on their books an order for 100,000 yards of carriage cloth, for a Michigan concern. The management are talking about adding more looms and enlarging the dyehouse, all of which will be done in the near future. This is one of the best plants the writer has had the pleasure of visiting, and everything is kept up in first-class shape, not only on the inside of the plant, but on the outside as well. The manager is a hustler, even if he did come from Philadelphia. The Buell Mfg. Co.'s line of blankets and robes for 1902 is certainly very attractive, and they cannot fail to enjoy a big business on such a line.

I next called at the two mills in Topeka, Kansas, and found both running in full blast and seemingly finding no fault with the world of business. Both these mills make their entire output into trousers, and both are kept busy every day in the year. Each is a two-set mill, strictly up-to-date, and has nothing but the best of machinery. I called on the Kansas City Pant Co., one of Kansas City's substantial industries. the firm is composed of two young men, Messrs. A. & M. Sheuerman, formerly of the Capital City Woolen Mills, Des Moines, Iowa, and their increasing business speaks well for their ability and push. Edgar S. Fildes is their foreman.

My next stop was at Bonaparte, Iowa. I called on Meek Bros.' Woolen Co., and found everything moving along nicely. I also found a new superintendent here in the person of Mr. M. R. Dredge, formerly with the Reedsburg Woolen Mills Co., Reedsburg, Wis. Mr. Joseph Woodhead, the former superintendent, accepted a similar position with the Albany Woolen Mills, Albany, Oregon, and resigned his position with Meek Bros. Mr. Woodhead was well liked at Bonaparte, and all wish him success in his new field.

My next call was at the Jacksonville, Ill., Woolen Mills. J. Capps & Sons. Like all other mills that are cutting their entire product into garments, they are very busy, and are turning out a nice line of men's wear, and have a good reputation for their product. I called on the Springfield Woolen Mills and found them running full on a high grade of men's wear, and with all the business they can take care of for some time.

The next place I had the pleasure of calling was on the Evansville Woolen Mills, Evansville, Indiana. Evansville

can boast of now having one of the best woolen mills west of the Allegheny Mountains; not only have they a fine arrangement of machinery, etc., but the building itself is a credit to any city. The main building is a large three-story brick building with large double windows, giving a large amount of daylight, which is so necessary for the successful running of textile mills. The above-mentioned mill was built nearly three years ago, and all the machinery from the old building moved into the new one, making it a seven-set plant complete. The writer was told, while there, that they were not able to fill their orders and were adding more looms. The above does not sound very much as though there was an opening for a calamity cry.

At New Albany, Indiana, both mills were running full, and at neither of them was there any grumbling. I found the same condition of affairs at Seymour, Indiana. The Seymour Woolen Factory Company have all they can do. Mr. Schneck, the president and manager, is an everyday, up-to-date business man, keeps his mill on a hustle and believes that half a loaf is better than no bread. While at Madison, Indiana, I called on the Ross Textile Company. This mill is for sale, and Mr. Ross told the writer that he would give some one a bargain. This is a 6-set mill, all 60-inch cards; in fact, it is complete in every department and all in a fine, large roomy building, well situated on the Ohio river. J. Schofield & Son, also located at Madison, are running getting their samples out for the season's trade. These people enjoy an extensive local trade, and are successful manufacturers. F.

Cotton Operatives Fifty Years Ago.

A correspondent of the Cotton Factory Times quotes from an item in an old English newspaper dated 1850, in which a cotton operative, a spinner's wife, gave a statement of income and outgo in her household, as follows:

Wages.

My husband's wages (per week)	$2.04
My wages (per week)	1.80
	$3.84

Expenditure.

Rent	$ .72
Fire and candle	.28
Washing and soap	.36
Neighbor for looking after children	.12
Sick club	.08
Burial club	.02
Flour and barm (brewery yeast)	.64
Fresh meat	.30
Coffee and tea	.28
Sugar	.36
Potatoes	.12
Butter	.40
Milk	.14
Paper	.02
	$3.84

This woman had three children, the oldest, a girl nearly eight years of age, cared for the other two until the mother was released from the factory at night. The girl expected when she reached the age of eight to go to work in the mill. This pathetic picture represents general conditions of fifty years ago. While they have changed greatly for the better, their evil results are still with us. The workers of those days suffered, but the greatest sufferer from such conditions is posterity, by an inheritance of ignorance and disease.

The Buffalo Forge Co.

The Sauquoit Silk Mfg. Co. has recently placed an order with the Buffalo Forge Co., of Buffalo, N. Y., for eight of their High Speed Automatic Engines which will be used in their works at Scranton, Pa., Philadelphia, Pa., and Bethlehem, Pa., four at the first and two at each of the latter plants. These will be of the enclosed type, running in oil, which thus presents no difficulties in the way of damage to goods by throwing oil on them. The engines will be located at various points throughout the factories and used principally as auxiliaries in the case of break-downs to the main engines, so that the separate sections of the mills may be kept running without loss of time. The decreased efficiency of small, high speed engines over a central unit will be made up for in this case by the avoidance of belding.

Textile Patents.

Continued from page 665.

Protector for Ring Spinning Frame. 695,876. John Wall and Michael E. Schedlbauer, Jr., Amsterdam, N. Y., assignors to the Ring Frame Protector Co., Amsterdam, N. Y.

Spinning Spindle. 695,179. Geo. W. Stafford, Providence, R. I., and Stephen M. Hamblin, Central Falls, R. I.

Shedding Mechanism for Looms. 695,609. Baptiste Hilbert, Worcester, Mass.

Take-up Mechanism for Looms. 695,373. Zebulon L. Chadbourne, New Brighton, N. Y.

Warp-Stop Motion for Looms. 694,083. Horace Wyman, Worcester, Mass., assignor to the Crompton & Knowles Loom Works, Worcester, Mass.

Weft Replenishing Mechanism for Looms. 695,696. Felix C. Donnell, Pawtucket, R. I.

Warp Twisting Machine. 695,566. Wm. E. Krey, New York, N. Y., and Anton Duppler, Jersey City, assignors to the Automatic Twisting-In Machine Company, a corporation of New Jersey.

Weaving Machine. 695,791. Zebulon L. Chadbourne, New Brighton, N. Y.

Weaving Pile Fabrics. 695,582. Heinrich Roesgen, Erkrath, Germany, assignor to the firm of M. C. Burchartz & Co., Elberfeld, Germany.

Wool Cleaning Machine. 695,652. Frederick G. Sargent, Graniteville, Mass.

Warp-Stop-Motion Mechanism. 696,083. Charles F. Roper, Hopedale, Mass., assignor to Draper Co., Portland, Me. and Hopedale, Mass.

Weft-Stop-Motion for Narrow-Ware Looms. 695,982. Fred B. Wilkins, Woonsocket, R. I.

Warp-Stop-Motion for Narrow-Ware Looms. 695,981. Fred B. Wilkins, Woonsocket, R. I.

Warp Beam Support for Narrow-Ware Looms. 695,983. Fred B. Wilkins, Woonsocket, R. I.

Woven Pile Fabric. 696,015. Thomas B. Dornau, Philadelphia, Pa.

Yarn Changing Mechanism for Circular

Knitting Machines. 694,515. W. P. Young, Woonsocket, R. I., assignor to the American Knitting Machine Company, Philadelphia, Pa., a corporation of New Jersey.

Improvements in Jacquard Weaving.

In a lecture recently delivered before the Bradford, Eng., Textile Society, A. F. Barker made some suggestions looking to improved methods in jacquard weaving. He spoke of the designograph, which was essentially a Bradford invention. Szczepanik's photographic method of designing was then described and illustrated by many interesting lantern slides.

Electric card-cutting was the natural development of the system of designing to which he had just alluded. The latest development in card-cutting was that of Zerkowitz. By this process the cards were cut from the design with electric "feelers"—which was not new—but eight cuts were made per card, instead of the whole card being cut at once, as in a machine he had previously described. There was one disadvantage; the card was not cut as quickly; if, by cutting the card at once a perfect article could not be obtained, and the contrary was the case when eight cuts were taken at each card, the latter was, of course, the better system.

The difficulty which other designers of this type of machine had experienced was the sparking of the electric "feelers" on the design sheet itself; this drawback Zerkowitz had obviated by breaking the current before the "feelers" left the design. This was a little detail that made all the difference in the actual working of the machine. One of these machines, entailing a weekly wage of $10.75, was equal to six of the ordinary machines and two repeaters, involving a weekly wage of $40. Simplicity was its great feature. Its cost was likely to be about $500; but against that he might say that the six machines and two repeaters, with which he had contrasted Mr. Zerkowitz's machine would cost $1050. There would be a great advantage if some large company could take up these inventions and carry them out, not singly but together on efficient lines. In bringing these inventions before the meeting, he wished to remark that he had felt it to be a duty which the college owed to the industry of the city that those engaged in the textile manufactures should profit from the newer processes, if there were profit to be derived from them.

One of the speakers, in the discussion following the lecture, stated that a company had been formed with a view to establishing the head centre of Szczepanik's photographic designing in Bradford, and before many months were over any designer would be able to send a sketch, no matter how large or how elaborate, and that sketch would be sent back to the firm the same day on point paper, ready for card cutting.

An Historical Relic.

The pale blue silk vest worn by Charles I. on the scaffold was sold by auction on Monday, at the rooms of Mr. J. C. Stevens, 38 King Street, Covent Garden, London. The genuineness of the relic is well authenticated; it was sold by Mr. Stevens on November 8, 1898, and was then purchased for $1000 by the late Mr. E. A. Brocklehurst, in consequence of whose death it has again come into the market. The bidding started at $100 and, rising by $50 steps without a pause, the relic again realized $1000, the new owner being Mr. Berney Ficklin.—Textile Mercury.

French Trade in the Middle Ages.

During the tenth and eleventh centuries the interior commerce of France showed little activity, while the royal power was feeble. The nobles and the priests were the sole customers of the artisan; the most prosperous trade was that in arms and ecclesiastical paraphernalia. The nobles in their castles had few needs and no luxurious tastes; the middle classes had still less. The commerce between different districts was almost completely wanting; all transactions were completed on the spot in manufactured as well as agricultural products. If the crops failed in one province, its inhabitants starved, no matter what abundance might prevail in the neighboring province.

The great current of commerce ran from the Mediterranean to the North Sea; it ascended the Rhone and descended the Rhine to reach Cologne and the German ports on the North Sea and the Baltic. Its branches extended to Bourgoyne, Champagne, the Isle of France, Normandy and Flanders, all in close relations with England. The merchants preferred the water to the land route, as being cheaper and surer.

At the frontier of each province, of each seigniory, entrance and exit tolls were exacted; it was necessary to pay in order to pass the bridges and to get obstructions removed from the route. Even as late as 1314, the wagons transporting fish from the sea to Paris were intercepted by the monks of Beauvais, who imposed tribute; they required each basket to be unpacked, chose the best part of their contents and caused such long delays that the remainder was spoiled by the time it reached Paris. Other seigniors, wishing to enjoy fresh fish at such a low price, imitated them.

Besides the exactions, more or less lawful, of the nobles, there were the risks of pillage by brigands concealed along the mountain routes or in the ruins of abandoned castles. The nobles collected taxes under the pretext that their passports insured the safety of travelers, but they declined to warrant the validity of these documents after night had fallen.

About the fourteenth century conditions improved to some extent, and tolls were collected in a more regular manner. Foreign traders, who up to this time had been either excluded from the country or exploited without mercy, now found a little security. A marked change had taken place and luxury had found its way into the castles of the nobility as well as into the houses of the wealthy middle class. The lady of the manor desired silks, expensive furs, jewels; the lord of the manor, arms for offense and defense, Arabian steeds, well bred dogs and birds, wines in plenty, carved furniture, vessels of gold and silver, rich carpeting. The bourgeoisie maintained a plain and severe exterior, but displayed within their houses a substantial luxury. —H. Pigeonneau, History of French Commerce.

IN AND OUT OF THE MILL.

Edmund Cartwright—Poet and Inventor.

We turn from the story of Richard Arkwright's struggles, failures and successes, which were told briefly in a sketch last month, to the life of his contemporary and brother inventor, Edmund Cartwright.

The equipment of these two men for the battle of life was vastly different. They came into the world under conditions of the most opposite kind. The first was born to penury and hardship. His life was a struggle from the beginning. He fought his way from the bottom to the top of the ladder, every rung the mark of a personal combat with adverse circumstances.

Cartwright, on the contrary began life with the advantages of high education and excellent home associations. His people were an old, respected and thrifty family who had been landmarks for generations in Nottinghamshire where he was born, in 1743. His early education was obtained at Wakefield grammar school. At fourteen he went to University College, Oxford. He was a lad of brilliant mental qualities, and by his ambition and attention to his studies earned the high regard of his masters.

He was anxious to become a fellow of Magdalen before he was graduated from University College. This was against custom and rule, but because of his merit influence was brought to bear and a special act was passed allowing him to do so, and he was then elected a fellow of Magdalen. And so he was blessed with successful achievement at the very morning of his life.

His mind was poetic, and he wrote verses from an early age. His first poem to create any lasting impression on the public, however, was published when he had reached his twenty-ninth year. It was founded upon a legend and was called "Armine and Elvira." It gained great popularity, running through several editions.

Cartwright was not alone a brilliant scholar and a poetic dreamer he was of a religious turn of mind, and he became an Episcopal clergyman. He had the good fortune to be presented with a perpetual curacy, which gave him a fair maintenance, and later he was appointed rector of Goodby Marwood. He married a lady of means who appears to have owned property near Doncaster; and it was here that the value of his greatest invention, the power loom, was first demonstrated by practical use.

Cartwright appears to have been a man much interested in the affairs of the day. The struggle between the American colonists and England was a source of distress to him, and about 1779 he published anonymously an ode entitled "The Prince of Peace," deploring the contest.

At about this time he began first to show a taste for experiment and invention. He devoted considerable time to agricultural cultivation of his glebe land (the name given to lands belonging to an ecclesiastical living.) He wrote on the subject of agricultural experiments for a monthly review, attended to his churchly duties, and generally lived the life of a quiet country gentleman.

On how small a thing sometimes the turning of one's life depends! A holiday visit was the key which unlocked to Cartwright the door of fame as an inventor. Spending a vacation at Matlock, near the site of Arkwright's cotton spinning mills at Cromford, he became interested in his inventions. He happened to remark in conversation that Arkwright would have to set his wits to work to invent a machine for weaving. He argued that this should prove no more difficult than had other devices which had been carried to successful completion. We are told that as a result of this conversation Cartwright upon his return home set to work to construct a power loom. He had, however, never seen the hand loom then in use, and the machine which he made was a clumsy affair, quite inadequate to take the place of the earlier one. Nevertheless he covered this firstling of his brain with a patent, and began working out improvements upon it.

He removed to Doncaster, where through his wife he had become possessed of some property. Here he studied the principle and working of the hand loom. He issued new editions of his poems, too, but his poetic muse seems to have suffered at the hands of the genius of invention, for the poems which he wrote at this period of his career were of less merit than his earlier publications.

Satisfied that at last his loom was in shape to be recognized as of practical value, Cartwright visited Manchester for the purpose of having a model constructed. This model was favorably criticised by able mechanics, but he was unable to enlist the co-operation of manufacturers. He took out two more patents on his machine, and, being unable to introduce it through manufacturers, Cartwright, with perseverance worthy of Arkwright, set up a factory of his own at Doncaster.

The loom which he installed there was the parent of the present power loom, and though it is asserted that Cartwright's was not the first power loom invented, it was the first of which practical use was made, and the first upon which cloth wide enough for general use was manufactured. It was a joyful day for Cartwright when his dreams became a reality, and his loom wove and spun without the motion of the hands and feet of the operator.

Yorkshire had for centuries been the centre of the woolen manufacture, but up to Cartwright's time no method of combing wool other than by hand had been thought of. At Doncaster he put in use a machine for this purpose. His idea substituted mechanical action for manual, and even in the earliest stages of its development it greatly reduced the cost of woolen manufacture, one ma-

chine doing the work of twenty hand combers. By the installation of a single set of machines a manufacturer could save something like $6000 per annum in wages paid to hand combers.

Trouble was ahead of Cartwright, however, and he had much opposition to overcome. Not only did the workmen look unfavorably upon his loom, but petitions against the use of his combing machine poured into the House of Commons, from the combers, fifty thousand strong. The House appointed a committee to investigate. Nothing, however, came of this opposition to progress, which in our day seems on the face of it absurd.

Cartwright, after many difficulties, finally contracted to furnish a large number of his power looms to a manufacturer who built a mill at Manchester especially for installing them. This mill was burned to the ground, presumably by workmen who had been displaced, or feared to be, by the introduction of mechanical labor for hand. This catastrophe put an effectual damper upon the adoption of his inventions by other manufacturers, and Cartwright found himself so deeply in debt through his experiments that he was obliged not only to sign away what property he owned, but even his patent rights. Then his poetical tendencies came to the rescue, and we may feel that he took a sort of gloomy pleasure in the writing of a sonnet which he published, recording his tribulations.

He afterwards moved to London, where his active brain kept on with experiments, some of which were useful, but many wholly unpractical. Among the better known of those in the latter category were the "geometrical bricks" of which he built a room in the small house which he inhabited.

In London his disappointed spirit found solace in an intimacy with Fulton, and in sympathetic work experimenting with him on the practical application of steam to navigation.

Cartwright never became a money-maker, a "captain of industry" in the sense of organizing and managing large commercial interests. He seems to have lacked the combative power to overcome opposition and to push his inventions to a paying issue. But by his work the world profited, and his name is handed down as that of one who broadened the road for manufacture, and opened up new lines of industry. And though financially unsuccessful, Cartwright seems always to have had friends who were fond enough of him to extend a helping hand.

In 1786 he was appointed prebendary of Lincoln (a title carrying with it certain revenues accruing from church funds) by the Bishop of that See, and, when his patents had but a little while to run, through a petition to Parliament the time was extended. Later on, when he again directed his attention to agricultural writing and inventions, the Duke of Bedford gave him the management of an experimental farm. He introduced a reaping machine of merit, and his contributions to magazines devoted to husbandry, became widely known. In 1809 the House of Commons voted him £10,000 in recognition of the worth of his inventions. After this he bought a farm at Hollander, where he resided till his death. And so we see him at the close of a restless life, amid the peaceful scenes of rural England, where he died considerably over the allotted three score years and ten. He is described as a kind and courteous gentleman, who, by his lovable qualities, endeared himself to his friends.

Might Have Been Worse.

During the parade of a battalion of soldiers recently, an order was given by the major, whereby all the men were to face to the right upon halting. In executing the movements part of the battalion got mixed and when halted was faced in the opposite direction, this being one of the most serious mistakes that could be made.

After arranging the men in their proper positions, the major, in a clear, loud voice said: "Gentlemen, that was fine;—I have seen worse;—but I don't know where."

A Long Way Home.

A man was going home to his wife and family. It was growing dark, and as his road was a lonely one, he was getting along as fast as he could, when he suddenly suspected that a man behind was following him purposely. The faster he went, the faster the man went, until they came to a churchyard.

"Now," he said to himself, "I'll find out if he's after me," and he entered the churchyard.

The man followed him. Vague visions of revolvers and garroters grew upon him. He made a detour of a splendid mausoleum; still the man followed him, round and round.

At last he turned, and facing the fellow, said:

"What the dickens do you want? What are you following me for?"

"Well, sir, do you always go home like this? I'm going to Mr. Brown's house with a parcel, and the porter at the station told me that if I'd follow you, I'd find the place, as you live next door. Are you going home at all, tonight?"

O.

This is the peach that Bobby saw,
Round and smooth and hard and raw;
'Twas tempting as a peach can be,
And looked alluring on the tree.
But his life was saved—for that young peach
Was just beyond our Bobby's reach.

When evening shades are falling
And all is calm and still,
I rest myself, for I've just had
A hard day at the mill.

Poetic thoughts then come to me,
And all seems good and bright;
Until—the baby cries, and then
I walk the floor all night.

Full many a jam of poorest red and green,
The dark, undusted shelves of pantry bear;
Full many a kid is born to swipe unseen,
And taste its sweetness 'neath the cellar stair.

—When the children take their cod liver oil without a fuss they receive two pennies for their money box.

When the money box is broken open, another bottle of cod liver oil is bought with the contents.—Le Rire.

The Kind She Wanted.

Willie's mother wanted some Diamond Dyes to color some dress goods with, so she called her wonderful son and said: "Willie, go down to Quigg's Drug Store and get me ten cents' worth of Diamond Dyes; now be sure and don't forget what you are going after."

On his way down, Willie played a few games of marbles, had three or four fights, so that when he arrived at the drug store he had entirely forgotten what he had been sent for.

"Say, mister," said Willie, inquiring of the clerk, "what's that stuff people die with?"

"Small-pox," said the clerk.

"That's it," said Willie; "me mother wants ten cents' worth—and she wants the bright red kind."

Take Our Advice, and—

Don't worry about anything. Don't eat too much. Don't eat too little, to save a few cents. Be moderate in everything. Rest and sleep all you can. Sleep is nature's benediction—God's "good-night." Be cheerful; a light heart lives long. Think only healthful thoughts; as a man thinketh in his heart, so is he. Seek peace and pursue it. Work like a man, but don't be worked to death. Avoid passions and excitement; a moment's anger may be fatal. Associate with healthy people; health is contagious as well as disease. Don't carry the whole world on your shoulders, far less the universe. Trust the Eternal. Never despair.

Real Sympathy.

Sympathy of the real genuine kind is always pleasant to have, in one's misfortunes, even if not accompanied with any material proof, but it is usually genuine when it puts its hand in its pocket. It is told of a good old Philadelphia Quaker, that being at a gathering where the troubles of some man were under discussion, and hearing people say they were "so sorry" for him, he quietly took off his broad-brim, and putting some money into it said:

"Friends, I am sorry for this poor man to the amount of five dollars."

Then turning to his neighbor:

"How much is thee sorry for him, Friend?" and so on, until a good round sum had been collected.

Another case in point was that of a wealthy and somewhat pompous gentleman, who, seeing a former friend so reduced in circumstances that he was selling pies, came up and began to sympathize and condole with him. The pie merchant listened as patiently as he could, until at last, exasperated beyond endurance, he exclaimed:

"Oh d—n your sympathy. Buy a pie!"

Cotton and Beans.

To those who know the similarity, when the plants are young, between cotton and that "cheerful fruit" which is said to be the staple article of food in Boston, the disgust of the Texan gentleman will be amusing.

He was asked how he liked a Massachusetts young man who had lately visited him.

"Humph! he didn't know anything. I took him out in my 50-acre cotton patch, and all he said was:

"'Well! by the Sacred Codfish! Will you look at the Beans!'"

Didn't Dare to Risk It.

Inhabitants of a Minnesota town remember Eben Jones, the crabbed millionaire lumberman who hired all the mill-hands himself. One day a Swede applied to the irritable old man, and secured a place on the saws.

As he was leaving he said, "Mester Yones, in dees yob you geef me doaller and hallef a day. Besides dat, do you eat me or do I eat myself?"

"Oh, eat yourself!" replied the old man. "I have dyspepsia."—Youth's Companion.

Cheap at the Price.

A certain pompous and officious judge in a western town had just fined a young lawyer $10 for contempt of court. After it had been paid a grave old attorney walked up to the bench and laid down a $10 gold piece.

"What is that for?" asked the judge.

"For contempt, your honor," was the reply.

"But I didn't fine you for contempt," answered the judge. "There must be some mistake."

"O, no, there isn't," replied the old man. "I have cherished a secret contempt for this court for a long time, and I'm willing to pay for it."—Chicago News.

Past the Hour.

I stood in the hall at midnight
When the clocks were striking the hour,
And counted the strokes in horror,
And longed for the magic power
To turn Time's footsteps backward
And enable myself to shout
Up-stairs in courageous accents,
"Shall I put the milk-can out?"

—Judge.

Tell Him So.

If you have a word of cheer
That may light the pathway drear
Of a brother pilgrim here,
Let him know.
Show him you appreciate
What he does; and do not wait
Till the heavy hand of Fate
Lays him low.
If your heart contains a thought,
That will brighter make his lot,
Then, in mercy, hide it not;
Tell him so.

—I. A. Edgerton.

A Few "Stops."

Stop saying you are tired.

Stop rehearsing your troubles.

Stop bothering about your neighbor's performances.

Stop minding anybody's business but your own, and nine times out of ten it is best to stop minding that.

Stop fussing. Stop nagging. Stop criticising, and for heaven's sake stop thinking of yourself as a fool, a good-for-nothing, or a sinner.

—Swipesey O'Mugg (in a tone of disappointment)—De boss said he wus goin' ter give dat girl the devil."

Mikesey—"An' didn't he do it?"

Swipesey—"Naw. He didn't give her no devil; he jist blew her up."

No Joke.

Upon his arrival home from a business trip, Mr. Jones was met at the door by a nurse who informed him of a very happy event which had taken place in his home that morning—and that hereafter he was to be called Papa.

Jones at once called up his partner on the telephone. This is what took place between them:

"Hello, Burrows, is that you? This is Jones. I have got a good joke to tell you, Burrows."

"All right, Jones; I am very busy, so you will have to hurry."

"Good joke, Burrows. Ha! Ha!—it's a boy."

Mr. Jones then inquired of the nurse and found out that he was the father of twins.

He at once called up Burrows again, and said:

"Hello, Burrows; this is Jones."

"Hello, Jones. What you got—another joke?"

"No, Burrows—no joke—twins!"

—We all admire the cloud with the silver lining so long as we are sure some one else will not get all the lining while we are left to take the cloud.

Your Belts

You don't run
tight belts from choice, do you?
You have to get power.

We know you don't believe in belt dressing. We don't blame you.

But you will believe in CLING-SURFACE if you will investigate what it will do.

It isn't a belt dressing. It's a BELT FILLER and PRESERVATIVE.
It penetrates a porous belt, leaves the surface clean, not sticky, and it preserves the belt, keeping it pliable.
It stops all slipping and you can run easy belts under fullest loads and improve quantity and quality of output.
It makes your belts last longer and do more work all that time.

TRY IT. PAY ONLY IF O. K.

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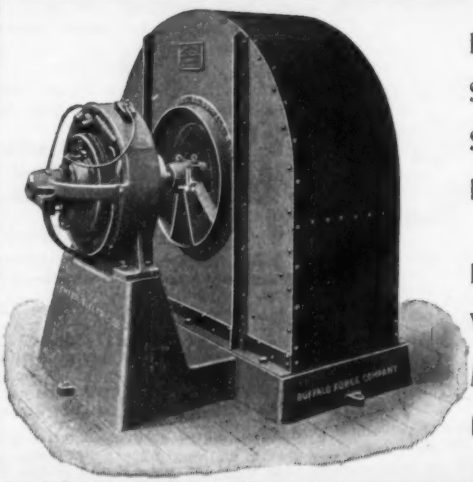
Buffalo Forge Company Buffalo



Buffalo
Steel Plate Fans
Steam,
Pulley, Electric,
FOR
Heating,
Ventilating, Drying,
Mechanical
Draft, etc

Buffalo Forge Company Buffalo

BUYERS' INDEX.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

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Air Moistening System.
American Moistening Co., 150 Devonshire St., Boston.

Architects and Mill Engineers.
Ferguson, John W., Paterson, N. J.
Gray, Arthur F., Exchange Bldg., Boston.
Green, Samuel M., Holyoke, Mass.
Praray, C. A. M. & Co., Banigan Bldg., Providence, R. I.

Attorney-at-Law.
Dawson, H. Horace, 309 Mutual Life Bldg., Philadelphia, Pa.

Automatic Feeds for Cotton and Wool.
Atlas Foundry & Mch. Co., Newark, N. J.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Phila., Pa.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Phila.
Smith, Jas. Woolen Machinery Co., Phila.

Bailing Machine.
Torrance Mfg. Co, 18 Davis St, E. Newark, N. J.

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Bands and Labels.
Docker-Foster Co., Phila., Pa.

Baskets.
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Belting.
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Boston Belting Co., Boston, Mass.
Dodge Mfg. Co., Mishawaka, Ind.
Jeffrey Manufacturing Co., Columbus, Ohio.
Main Belting Co, 1219 Carpenter St, Phila.
Popham, Henry, & Son, Newark, New Jersey.
Shultz Belting Co., St. Louis, Mo.
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Belt Dressing.
Alexander Bros, 410 No. 3d St, Phila, Pa.
Cling Surface Mfg. Co., 168 Virginia St., Buffalo, N. Y.
Main Belting Co, 1219 Carpenter St, Phila.
Stephenson Mfg. Co., Albany, N. Y.

Belt Hooks.
Bristol Co., Waterbury, Ct.

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Bleaching Materials.
Bosson & Lane, Boston.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Block Cutting for Printing.
Atlas Copper Stamp Works, 15 Whitehall St., New York.

Blowers, and Blower Systems.
American Blower Co., Detroit, Mich.
Buffalo Forge Co., Buffalo, N. Y.
Hartford Blower Co., Hartford, Conn.
The Sterling Blower & Pipe Mfg. Co., 44 Huyshope St, Hartford, Conn.
Sturtevant, B. F. Co., Boston, Mass.

Bobbins, Spools, Shuttles, Etc.
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Murray, C. O., Nashua, N. H
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Burr Pickers.
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Sargent's, C. G., Sons, Graniteville, Mass.
Smith, Jas. Woolen Machinery Co., Phila.

Calculating Apparatus.
Pennsylvania-Eastern Syndicate, Bourse Building, Philadelphia, Pa.

Calico Printers' Machinery and Supplies.
Arlington Machine Works, (Arthur Birch) Arlington Heights, Mass.
Birch Brothers (Albert Birch), Somerville, Mass.
Butterworth, H. W., Sons & Co., Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
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Lane, W. T. & Bro., Port Chester, N. Y.

Carbonizing.
Riverdale Woolen Co., Northbridge, Mass.

Carbonizing Machinery.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Phila.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts, Phila.
Sargent's, C. G. Sons, Graniteville, Mass.
Smith, Jas. Woolen Machinery Co., Phila.

Card Clothing.
Ashworth, Elijah, Fall River, Mass.
Booth, Benj. & Co., Philadelphia.
Edma Card Clothing Co, 422 S. 5th St, Camden, N. J.
Leigh, Evan A, 35 Mason Building, Boston

Card Grinding Machinery.
Hardy Machine Co., Biddeford, Me.
Smith, Jas. Woolen Machinery Co., Phila.

Carders' Tools.
Brown, W. H, Mechanic St, Worcester Mass.

Carpet Machinery.
Altemus, W. W, & Son, 2816 N. 4th St, Phila. Pa.
Curtis & Marble Machine Co, Worcester, Ms.
Farbush, M. A, & Son, Machine Co, Phila. Pa.
Granger Foundry & Machine Co., Providence, R. I.
Howard, Geo. C., Lansdowne, Pa. and 2123 Market St., Philadelphia, Pa.
Parks & Woolson Mach. Co., Springfield, Vt.
Smith, Jas. Woolen Machinery Co., Phila.

Castings.
American Ferrofix Co., 20 Broad St., N. Y.
Livermore, Homer F., 85 Pearl St., Boston.

Chemicals and Apparatus.
Fiedt, Geo. D. & Co, 528 Arch St, Phila, Pa.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Cling Surface.
Cling Surface Mfg. Co., Buffalo, N. Y.

Clocks.
Howard, E. Clock Co., 403 Washington St., Boston, Mass., 41 Maiden Lane, New York.
Riggs & Brothers, 310 Market St. Philadelphia, Pa.

Cloth Boards.
Chaffee Bros., Oxford, Mass.
Rice, T. B., Mifflin St. Wharf, Phila.

Clutches.
American Tool & Machine Co., Boston, Mass.
Dodge Mfg. Co., Mishawaka, Ind.
Eastern Machinery Co., The, New Haven, Conn.
Hunter, James, Machine Co., North Adams, Mass.
Smith, Jas. Woolen Machinery Co., Phila.
Smith, T. H., Cotton Mill, Jamestown, N.Y.

Combs (Wool and Cotton)
Crabb, William, & Co, Newark, N. J.
Townsend, Thomas, 157 Orange St., Providence, R. I.

Commission Merchants (Dry Goods, Knit Goods).
Charleston Export & Commission Co., Charleston, S. C.

Conveying Machinery and Chains.
Jeffrey Manufacturing Co., Columbus, O.
The Sterling Blower & Pipe Mfg. Co., Hartford, Conn.

Cop Tubes.
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Copper Gaskets.
U. S. Mineral Wool Co., 149 Liberty St., New York.

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Copper Print Rollers.
Phillips Co, The Thomas, Providence, R. I.
Taunton-New Bedford Copper Co., New Bedford, Mass.

Copper Work for Dyers.
Butterworth, H. W. & Sons Co., Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Phillips Co, The Thomas, Providence, R. I.

Cotton.
Blaisdell, Jr., Co., S., Chicopee, Mass.
Charles, W. B., Amsterdam, N. Y.

Cotton Bale Ties.
DeHaven Mfg. Co., 50 Columbia Heights, Brooklyn, N. Y.

Cotton Elevators.
Buffalo Forge Co., Buffalo, N. Y.
Sterling Blower & Pipe Mfg. Co, The, 44 Huyshope Ave, Hartford, Conn.

Cotton Machinery.
Brownell, G. L., Worcester, Mass.
Altemus, W. W, & Son, 2816 N. 4th St, Phila. Pa.
Ashworth, Elijah, Fall River, Mass.
Atherton, A. T., Machine Co., Pawtucket, R. I.
Barber & Colman, 11 Pemberton Sq., Boston.
Butterworth, H. W. & Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Mass.
Draper Company, Hopedale, Mass.
Easton-Burnham Co., Pawtucket, R. I.
Fairmount Machine Co, 22d and Wood Sts, Philadelphia.
Houghton, L. T. & Sons, Worcester, Mass.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kilburn, Lincoln & Co, Fall River, Mass.
Kitson Machine Co., Lowell, Mass.
Leigh, Evan A, 35 Mason Building, Boston.
Lever, Oswald, Lehigh Ave. and Masher St., Philadelphia.
Lowe, Stephen C., 186 Devonshire St., Boston, Agt. John Hetherington & Sons, Ltd.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
McKerrow, H. G., Boston, Mass.
Parks & Woolson Mach. Co., Springfield, Vt.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, Pa.
Philadelphia Textile Machinery Co, Hancock and Somerset Sts, Philadelphia, Pa.
Phillips Co, The Thomas, Providence, R. I.
Ring Frame Thread Protector Co., The Amsterdam, N. Y.
Saco & Pettee Machine Shops, Newton Upper Falls, Mass.
Schofield, Geo. L., Philadelphia.
Smith, Jas. Woolen Machinery Co., Phila.
Whitin Machine Wks Whitinsville, Mass

Cotton Openers and Lappers.
Atherton, A. T., Machine Co., Pawtucket R. I.
Kitson Machine Co., Lowell, Mass.
Howard & Bullough American Machine Co, Pawtucket, R. I.

Cotton Softeners.
Bosson & Lane, Boston, Mass.

Cotton Waste.
Blaisdell, Jr., Co., S., Chicopee, Mass.
Becker, C. W Agt., Amsterdam, N. Y.
Charles, W. B., Amsterdam, N. Y.

Cotton Yarns.
Moeller & Littauer, 109 Greene St., New York.

Credits.
National Mercantile Agency, New York and Boston.

Cutters for Knit Fabrics.
Goodwin, J. C., Diamond and Second Sts., Phila., Pa.
Kennedy, Thos. (Cutters, etc.,) Cohoes, N. Y.

Dating and Time Stamps.
Riggs & Brothers, 310 Market St., Philadelphia, Pa.

Dextrine.
Stein, Hirsh & Co, 165 Duane St., New York.

Dryers.
American Blower Co., Detroit.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Brothers (Albert Birch), Somerville, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Butterworth, H. W. & Sons Co., Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Hartford Blower Co., Hartford, Conn.
Hunter, Jas., Machine Co., No. Adams Mass.
Kenyon, D. R. & Son., Raritan, N. J.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Philadelphia Textile Machinery Co, Philadelphia, Pa.
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Rusden Machine Co., Warren, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Smith, Jas. Woolen Machinery Co., Phila.
Sturtevant, B. F. Co., 34 Oliver St., Boston, Mass.

Dusters.
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Dust Collectors.
Allington & Curtis Mfg. Co., Saginaw, Mich.
Hartford Blower Co., Hartford, Conn.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Phila.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Phila.
The Sterling Blower & Pipe Mfg. Co., 44 Huyshope St, Hartford, Conn.

Dyers, Bleachers and Finishers
American Yarn Printing Works, 134-150 North 22d St., Philadelphia.
Barnesville Mfg. Co., Barnesville, Ga.
Brophy's, T, Sons, Jasper St, Philadelphia
Cohoes Dye Works, Cohoes, N. Y.
Cranston Worsted Mills (yarns), Bristol, R. I.
Davidson & Brooke, 2560 No. 3rd St., Philadelphia.
Duncan & Baillie, Cohoes, N. Y.
Firth & Foster Co., Kensington, Pa.
Greenwood, R. & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket and Valley Falls, R. I.
Howard & Co., Rahway, N. J.
Lorimers, The Wm. H. & Sons Co., Phila.
Molt Bros., Millbury, Mass. (Indigo Blue.)
Pawtucket Dyeing & Bleaching Co, Pawtucket, R. I.
Pennypack Yarn Finishing Co., Holmesburg, Pa
Pond Lily Co., New Haven, Ct.
Providence Mills Mfg. Co., 55 Girard Ave., Philadelphia, Pa.
Rowland, Samuel, Schuylkill Haven, Pa.
U S. Finishing Co., New York.
Warren, W. Thread Works, Westfield, Mass.
Whittier Mills, Chattahoochee, Ga., Treasurer's Office, Springfield, Mass.

Dyeing, Drying, Bleaching and Finishing Machinery.
American Blower Co., Detroit.
Antisdel, E. M., 12 Miller St., Utica, N. Y., (Knit Dryer.)
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Bros. (Albert Birch), Somerville, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Butterworth, H. W, & Sons Co Phila Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Delahunty Dyeing Machine Co., Pittston, Pa.
Fairmount Machine Co, 22 and Wood Sts, Philadelphia.
Granger Foundry & Machine Co, Providence, R. I.
Hartford Blower Co., Hartford, Conn.
Howard, Geo. C., Lansdowne, Pa. and 2123 Market St, Philadelphia, Pa.
Kenyon, D. R. & Son, Raritan, N. J.
Klauder-Weldon Dyeing Machine Co., Amsterdam, N. Y.
Parks & Woolson Machine Co., Springfield, Vt.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, Pa.
Philadelphia Textile Machinery Co, Hancock and Somerset Sts, Philadelphia, Pa.
Philadelphia Textile Specialty Co., 500 North 12th St., Phila.
Phillips, The Thomas Co, 91-95 South Main St, Providence, R. I.
Rusden Machine Co., Warren, R. I.
Smith, Jas. Woolen Machinery Co., Phila.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass. (Drying.)

Dye House Cans.
Hill, James Mfg. Co., Providence, R. I.

Dye Sticks.
Bailey, Frank, Cedar Brook, New Jersey.
Ford, J. B. Co., Wyandotte, Mich.
Haedrich, E. M., Philadelphia, Pa.

Dyestuffs and Chemicals.
Atteaux, F. E. & Co., 174-176 Purchase St., Boston.
Berlin Aniline Works, 72 Front St., N. Y.
Bischoff, & Co, 87 Park Place, N. Y.
Bosson & Lane, 36 Central Wharf, Boston.
Corey, S. J, 273 Congress St, Boston
Cassella Color Co., 182 Front St., New York.
Dillon & Co, 20 Cedar St, New York.
Farbenfabriken of Elberfeld Co, 40 Stone St, N. Y.
Ford, J. B. Co., Wyandotte, Mich.
Fortner, L. B., 36 Strawberry St., Phila.
Geisenheimer & Co, 189 Front St, New York.
Holliday & Sons, Ltd., Read, 7 Platt St., New York.
Janney, O. S, & Co, Phila. and Boston.
Johnson, Chas. A, & Co, 22 Dey St, N. Y
Keller, John J, & Co, 104-106 Murray St, N. Y.
Klipstein, A, & Co, 122 Pearl St, N. Y.
Koechl, Victor, & Co, 132 Hudson St, N. Y.
Kuttroff, Pickhardt & Co., New York.
Linnehan, J. W. & Co., 185 High St., Boston.
Molt Bros., Millbury, Mass. (Indigo Blue.)
N. Y. & Boston Dyewood Co, 55 Beekman St, New York.
Oil Seeds Pressing Co., 15-25 Whitehall St., New York.
Roessler & Hasslacher Chemical Co, 100 William St, New York.
Sharpless Dye Wood Ext. Co, The Bourse, Phila, Pa.
Sykes & Street, 85 Water St, N. Y.
Thayer, Ed. M., 106 Broad St., Boston, Mass.
United Indigo & Chemical Co., Ltd., 176 Federal St., Boston.
Vila, H. S., 115 So. 2nd St., Philadelphia, Pa.

Dynamos.
General Electric Co., 44 Broad St., New York
Sturtevant, Co., B. F. Boston.

Edgings.
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Electrotyping and Printing.
Whitcomb, H. C, & Co, Boston.

Elevators.
Cohoes Foundry & Machine Co, Cohoes, N.Y.
Eastern Machinery Co, The, New Haven Conn.
Jeffrey Manufacturing Co., Columbus, O.
Howard, Geo. C., Lansdowne, Pa and 2123 Market St, Philadelphia, Pa.

Electrical Construction.
General Electric Co., 44 Broad St., New York.

Electric Fans.
American Blower Co., Detroit.
Buffalo Forge Co., Buffalo, N. Y.
General Electric Co., 44 Broad St., New York.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Phila., Pa
Sturtevant Co., B. F., Boston.

Electric Lighting.
General Electric Co., 44 Broad St., New York.

Electric Motors.
General Electric Co., 44 Broad St., New York.
Sturtevant Co., B. F., Boston.

Employers Time Recorders.
Riggs & Brothers, 310 Market St., Philadelphia, Pa.

Enamel Goods and Supplies.
Hartson, L. M. Co., North Windham, Conn.

Engineers, Mechanical.
Ferguson, John W, Paterson, N. J.

Exhaust Heads.
Burt Manufacturing Co., Akron, Ohio.
The Sterling Blower & Pipe Mfg. Co., 44 Hupshope St, Hartford, Conn.

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Feed Water Heaters.
Green Fuel Economizer Co., Matteawan N. Y.
Scaife, W. B. & Sons, Pittsburg, Pa.

Feed Water Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.
Scaife, W. B. & Sons, Pittsburg, Pa.

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Filters.
Automatic Water Purifying Co, 45 Broadway, N. Y.
Scaife, W. B. & Sons Pittsburg, Pa.

Finishing Machinery.
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Fluted Rolls.
Cohoes Foundry & Machine Co., Cohoes, N.Y
Thurston, A. G & Son, Box 528, Fall River, Mass.

Forges.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co, B. F., Boston.

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Friction Hoisting Drums.
Eastern Machinery Co., New Haven, Conn.

Fuel Economizers.
Green Fuel Economizer Co., Matteawan, N. Y.
Steam Boiler Equipment Co., 20 West Houston St., New York.

Fulling Mills for Woolen Goods.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter Jas, Machine Co, No. Adams, Mass.
Kenyon, D. R. & Son, Raritan, N. J.

Garnetts.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Phila.
Smith, Jas. Woolen Machinery Co., Phila.

Gas Engines.
Jones, Lewis, 60½ and Media Sts, Phila, Pa.

Gas Exhausters.
Sturtevant Co., B. F., Boston.

Gears.
New Process Raw Hide Co., Syracuse, N. Y.

Gear Cutting Machine.
Whiton, The D. E, Co, New London, Conn.

Generating Sets.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F, Boston.

Guides.
Hartson, L. M. Co., North Windham, Conn.

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Heddles.
Leisenring, John, Mfg. Co., Philadelphia, Pa.
Steel-Heddle Mfg. Co., 1842 Germantown Ave., Phila.
Watson, L. S, Mfg. Co, Leicester, Mass.

Hoisting Machinery.
Larrabee, John E., Amsterdam, N. Y.
The Eastern Machinery Co., New Haven, Conn.
Hose.
Boston Belting Co., Boston.
Hosiery Labels.
Dockes, Foster Co., Philadelphia, Pa.
Saranac Electrical Mfg. Co., St. Joseph, Mich.
Hosiery Boards.
Pearson, J. T, Kensington, Pa.
Humidifying Apparatus.
American Air Moistening Co., Boston.
Hydro Extractors.
American Tool & Machine Co , Boston.
Rusden Machine Co., Warren, R. I.
Ironing Machines for Knit Goods.
Craw, J. W. Laundry Machinery Co., So. Norwalk, Conn.
Jacquard Cards.
Rogers, H. E, South Manchester, Conn.
Key Seaters.
Leisenring Mfg. Co , Philadelphia, Pa.
Knit Goods Edgings, Trimmings, etc.
Cathcart, John & Co., 115 Franklin St., New York.
Chapin, Geo. W., Philadelphia, Pa.
Charles, W, B., Amsterdam, N. Y.
Cheney Bros, Silk Goods, 479 Broome St, N. Y.
Friedberger Mfg Co, Edgings, Germantown, Phila, Pa.
Hepner & Horwitz, Lacings, 30 Howard St, N. Y.
Krout & Fite Mfg. Co, Allegheny Ave. and Emerald St., Phila.
Weimar Bros, 1817 East York St, Phila. Pa.
Knit Goods Finishing Machines, Crochet, Etc.
Arnold Sewing Machine Co., 216 High St , Newark, N. J.
Craw, J. W. Laundry Machinery Co., So. Norwalk, Conn.
Merrow Machine Co, The, Hartford, Conn.
Nye & Tredick Co., 606 Arch St, Phila, Pa.
Scott & Williams, 2079 E. Cumberland St, Phila Pa.
Willcox & Gibbs Sewing Mch. Co., New York.
Knitting Machine Cylinders.
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Stafford & Holt, Little Falls, N. Y.
Knitting Machinery.
Adams Top Cutting Machine Co., 11 Broadway, N. Y.
American Knitting Machine Co., 6th and Arch Sts., Philadelphia, Pa.
Antisdel, E. M., 12 Miller St., Utica, N Y.
Branson Machine Co., 506 N. American St., Philadelphia.
Brinton, H. & Co., 213 Race St., Philadelphia, Pa.
Cooper, Chas, Bennington, Vt.
Crane Mfg. Co, Lakeport, N. H.
Excelsior Knitting Machine Manufacturing Co., Allentown, Pa.
Goodwin, J. C., Second and Diamond Sts., Phila., Pa. (Cutters.)
Jenckes, E. Mfg. Co, Pawtucket, R. I.
Jones, Lewis, 60 1-2 and Media Sts, Philadelphia, Pa.
Kennedy, Thos. (Cutters, etc.), Cohoes, N. Y
Keystone Knitting Machine Mfg. Co., 40 N 7th St., Phila.
Lamb Knitting Mach. Mfg. Co., Chicopee Falls, Mass.
Leighton Machine Co, Manchester, N. H.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
McMichael & Wildman Mfg. Co, Norristown, Pa.
Mueller, Arthur, 760 Lexington Avenue., Brooklyn, N. Y.
Nye & Tredick Co., 606 Arch St, Phila, Pa.
Paxton & O'Neill, 127 Bread St, Phila, Pa.
Pepper Mch. Works, Lakeport, N. H.
Ruth & Co., Norristown, Pa.
Scott & Williams, 2079 E. Cumberland St., Phila., Pa.
Snyder, Homer P. Mfg. Co., Little Falls, N. Y.
Stafford & Holt, Little Falls, N. Y.
Taylor, James, 835 Arch St., Philadelphia.
Tompkins Bros., Troy, N. Y.
Knitting Needles and Supplies.
Breedon, Wm, & Son, Amsterdam, N. Y.
Brinton, H. & Co., 213 Race St., Philadelphia, Pa.
Cooper, Chas, Bennington, Vt.
Corey, Wm, Co, Manchester, N. H.
Crane Mfg. Co., Lakeport, N. H.
Dodge Needle Co., Manchester, N. H.
Ives, Loyal T, New Brunswick, N. J.
Keystone Knitting Machine Mfg. Co., 40 N 7th St., Philadelphia.
Lamb Knitting Machine Mfg. Co., Chicopee Falls, Mass.
Manufacturers' Supplies Co., 66 No. 4th St. Philadelphia.
Mayo Knitting Machine & Needle Co Franklin, N. H.
Page Needle Co , Chicopee Falls, Mass.
Treat, Orion, Manchester Green, Conn.
Wardwell Needle Co, Lakeport, N. H.
Knotter for Spoolers.
Barber & Colman, 11 Pemberton Sq., Boston
Labeling Machine.
Saranac Electrical Mfg. Co., St. Joseph, Mich.
Laboratory Outfits.
Feldt, Geo. D. & Co, 528 Arch St. Phila, Pa.
Leather Boards.
Rogers, H. E, South Manchester, Conn.
Lightning Apparatus.
Pennsylvania Eastern Syndicate, Bourse Building, Philadelphia, Pa.
Looms.
Draper Company, Hopedale, Mass.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Furbush, M. A. & Son Co, Phila, Pa.
Howard, Geo. C., Lansdowne, Pa. and 2128 Market St., Philadelphia, Pa. (For wire.)
Kilburn, Lincoln & Co, Fall River, Mass.
Leigh, Evan A., 35 Mason Bldg., Boston.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Smith, Jas. Woolen Machinery Co., Phila.
Stafford, G. W. Mfg. Co , Readville, Mass.
Whitin Machine Works, Whitinsville, Ms,
Loom Harnesses.
Leisenring, John, Mfg. Co., Philadelphia.
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Loom Picker Co., Biddeford, Me.
Loopers.
Beattie's Machine Works, Cohoes, N. Y.
Lubricators
Dixon, Jos., Crucible Co, Jersey City, N. J.
Lumber.
Stearns, A. T, Lumber Co, Neponset, Mass.
Lumpers.
Gerry, George, & Son, Athol, Mass.
Machinery Dealers.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Schofield, Geo. L. Phila., Pa.
Taylor, James, 835 Arch St., Philadelphia
Machinists' Tools.
Dodge Mfg Co., Mishawaka, Ind.
Leisenring Mfg. Co., Philadelphia, Pa.
Whiton, The D. E. Co, New London, Conn.
Mails.
Walder, J, Paterson, N. J.
Measuring and Folding Machines.
Curtis & Marble Machine Co, Worcester, Ms.
Elliott & Hall, 544 Hermon St, Worcester, Mass.
Fabric Measuring & Packaging Co., Postal Telegraph Bldg , New York.
Parks & Woolson Mach. Co., Springfield Vt.
Mechanical Draft.
American Blower Co., Detroit.
Buffalo Forge Co, Buffalo., N. Y.
Hartford Blower Co., Hartford, Conn.
Mechanical Engineers.
Buffalo Forge Co., Buffalo, N. Y.
Green, Samuel M., Holyoke, Mass.
Sterling Blower & Pipe Mfg. Co, The, 44 Huyshope Ave. Hartford, Conn.
Sturtevant Co., B. F., Boston.
Mercerizing Machinery.
Butterworth, H. W. & Sons, Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Klauder-Weldon Dyeing Machine Co.,

Amsterdam, N. Y.
Philadelphia Textile Specialty Co., 500 North 12th St, Phila.
Rusden Machine Co., Warren, R. I.

Mill Architects.
See Architects & Mill Engineers.

Mill Baskets.
Lane, W. T. & Bro, Port Chester, N. Y.

Mill Brushes.
See Brushes.

Mill Builders and Engineers.
Ferguson, John W. Paterson, N. J.

Mill Sewing Machines.
(See Sewing Machines and Supplies.)

Mill Supplies.
American Supply Co, Providence, R. I.
Bamford & Smith, Pascoag, R. I.
Bristol, The, Co., Waterbury, Conn.
Buckley's, Benj. Son, Gun Mill, Paterson, N. J.
Chase Pulley Co., Providence, R. I.
Dixon Lubricating Saddle Co., Bristol, R.I
Dodge Mfg. Co., Mishawaka, Ind.
Douglas, R. D., Fall River, Mass.
Easton-Burnham Co., Pawtucket, R. I.
Hartson, L. M. Co., North Windham, Conn.
Hoag, A. W. & Co., Reading, Pa.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Jeffrey Manufacturing Co., Columbus, O.
Lane, W. T. & Bro., Port Chester, N. Y.
Larrabee, John E., Amsterdam, N. Y.
Leisenring, John Mfg Co., Phila., Pa.
Main Belting Co, 1219 Carpenter St, Phila.
National Supply Co., Paterson, N. J.
Oil Seeds Pressing Co., 15-25 Whitehall St., New York.
Shaw, Victor, Ring Traveller Co., Providence, R. I.
Smith, Jas. Woolen Machinery Co., Phila.
Southern Bobbin Co., Greensboro, N. C.
Steel-Heddle Mfg. Co., 1842 Germantown Ave. Phila.
Sterling Blower & Pipe Mfg. Co, The, 44 Huyshope Ave, Hartford, Conn.
Sweet & Doyle, Cohoes, N. Y
Thurston, A. G, & Son, Fall River, Mass.
Watson, L. S, Mfg.Co, Leicester, Mass.

Napping Machines.
Columbia Napping Machine Co., Somerville, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Jones, Lewis, 60 1-2 and Media Sts., Philadelphia, Pa.
Parks & Woolson Mach. Co., Springfield, Vt.

Noils (Silk.)
Ryle, Wm. & Co., 54 Howard St., N. Y.
Malcolm Mills Co., Frankford, Pa.

Office Specialties.
Niagara Clip Co., 123 Liberty St., New York.

Oil Filters.
Burt Manufacturing Co., Akron, Ohio.

Oils.
Oil Seeds Pressing Co., 15-25 Whitehall St., New York.

Oilless Bearings.
Arguto Oilless Bearing Co, Wayne Junction, Phila.

Overseaming Machines.
Arnold Sewing Machine Co, 216 High St., Newark, N. J
Merrow Machine Co., Hartford, Conn.
Union Special Sewing Machine Co., 75 Kinzie St., Chicago, Ill
Von Buchwald, W. J., 120 No. 7th St., Phila.
Willcox & Gibbs Sewing Machine Co., New York.

Oxidizing Machinery.
Hoag, A. W. & Co., Reading, Pa.

Packing.
Boston Belting Co, Boston.
Jenkins Bros., New York.

Pantagraphs for Mill Engraving.
Johnson, C. A, & Co, 22 Dey St, New York.

Paper Boxes.
Rosenberg, Henry, 107 Greene St., New York.

Paper Tubes.
Douglas, R. D., Fall River, Mass.

Patent Solicitors.
Crosby & Gregory, 34 School St, Boston, Mass.
Siggers, E. G., Washington, D. C.
Wolhaupter, D. P., Equitable Bldg., Washton, D. C.

Perforated Metals.
Beckley, A. J. & Co., 248 Pearl St., New York.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co., 100 William St, New York.

Picker Sticks.
Southern Bobbin Co., Greensboro, N. C.

Pipe Covering.
Keasbey, R. A, 83 Warren St, New York.

Pneumatic Conveying.
See Ventilating.

Portable Hoists.
Larrabee, John E., Amsterdam, N. Y.

Power Transmitting Machinery.
Arguto Oilless Bearing Co, Wayne Junction, Phila.
Chase Pulley Co., Providence, R. I.
Dodge Mfg. Co., Mishawaka, Ind
Eastern Machinery Co, New Haven, Conn.
Fairmount Machine Works, 23d and Wood Sts, Philadelphia.
Howard, Geo. C., Lansdowne, Pa. and 2123 Market St., Philadelphia, Pa.
Hoag, A. W. & Co., Reading, Pa.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jeffrey Manufacturing Co., Columbus, O.
Kilburn, Lincoln & Co, Fall River, Mass.
Rusden Machine Co., Warren, R. I.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Phila.
Saginaw Manufacturing Co., Saginaw, Mich.
Smith, Jas. Woolen Machinery Co., Phila.
Smith, T. H., Cotton Mill, Jamestown, N. Y.

Preparatory Machinery, (Cotton).
Atherton, A. T., Mach. Co., Pawtucket, R. I.
Howard & Bullough Am. Machine Co., Pawtucket, R. I.
Kitson Machine Co., Lowell, Mass.
Saco & Pettee Machine Shops, Newton Upper Falls, Mass.

Press Boards and Fenders.
Rogers, H. E, South Manchester, Conn.

Presses.
Boomer & Boschert Press Co., 338 West Water St., Syracuse, N. Y.
Butterworth, H. W. & Sons Co., Philadelphia.
Crawford, J. J, & Son, Nashua, N. H. (Power Screw, Hydraulic, Hollow Steam Plate.)
Curtis & Marble Machine Co, Worcester, Ms
Hart, Charles, Frankford, Philadelphia.
Howard, Geo C., Lansdowne, Pa. and 2123 Market St., Philadelphia, Pa.
Phillips Co, The Thomas, Providence, R. I.

Printers (Fabrics and Yarn.)
American Yarn Printing Works, Philadelphia.

Pulleys.
See Power Transmitting Machinery.

Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.
Rusden Machine Co., Warren, R. I.

Purifying & Filtration Plants.
Scaife, W. B. & Sons, Pittsburg, Pa.

Rag Pickers.
Smith, Jas. Woolen Mach. Co., Phila, Pa.

Raw Hide Gears.
New Process Raw Hide Co., Syracuse, N. Y

Reed and Harness Manufacturers.
American Supply Co, Providence, R. I.
Leisenring, John Mfg. Co., Phila.
Loom Picker Co., Biddeford, Me.
Walder, J. Paterson, N. J.

Reeds and Harnesses.
Leisenring, John, Mfg. Co., Philadelphia, Pa.

Remnants.
Feingold, H. & D., 91 Bedford St., Boston.

Ribbons.
Barton, F. C., 54 Franklin St., New York.
Cheney Bros. S. Manchester, Ct.

Ring Travellers.
DeHaven Mfg. Co, 50 Columbia Heights, Brooklyn, N. Y.
National Ring Traveller Co., Providence, R. I.
Shaw, Victor, Ring Traveller Co., Providence, R. I.

Rope Transmission.
American Mfg. Co., New York.
Carpenter, Geo. B. & Co., Chicago, Ill.
Dodge Mfg. Co., Mishawaka, Ind.

Roving Cans.
Diamond State Fibre Co., Elsmere, Del
Hill, James Mfg. Co., Providence, R. I.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.
Laminar Fibre Co., No. Cambridge, Mass.
Walrus Fibre Mfg. Co., Medford, Mass.

Rubber Covered Rollers and Goods.
Boston Belting Co., Boston.

Saddles and Stirrups.
Dixon Lubricating Saddle Co., Bristol, R. I

Sample Cards and Mounting.
Merchants Sample Card Co., 33 Sullivan St., New York.
Rosenberg, Henry, 107 Greene St., N.Y.

Scales
Sweet & Doyle, Cohoes, N. Y.

Scallop Machines.
Merrow Machine Co., Hartford, Conn.

Schools.
American Correspondence School, Boston, Mass
International Correspondence Schools, Scranton, Pa.
New Bedford Textile School, New Bedford, Mass.
Lowell Textile School, Lowell, Mass.
Philadelphia Textile School, Phila, Pa.

Screens (Perforated.)
See under Perforated Metal.

Selling Agents.
See Commission Merchants.

Separators.
Draper Co., The, Hopedale, Mass.
Ring Frame Thread Protector Co., The Amsterdam, N. Y.

Sewing Machines and Supplies.
Arnold Sewing Machine Co., 216 High St., Newark, N. J.
Arlington Machine Works. (Arthur Birch), Arlington Heights, Mass.
Birch Bros. (Albert Birch), Somerville, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Dinsmore Mfg. Co., Salem, Mass.
Fales, L. F., Walpole, Mass.
Manufacturers' Supplies Co., 66 No. 4th St., Philadelphia.
Rusden Machine Co., Warren, R. I.
Union Button Sewing Mch. Co., 164 High St., Boston.
Union Special Sewing Machine Co., 75 Kinzie St., Chicago, Ill.
Von Buchwald, W. J., 120 No. 7th St., Phila.
Wilcox & Gibbs S. M. Co., New York.

Shafting Hangers, Etc.
See Power Transmission Machinery.

Shearing Machinery.
See Dyeing, Drying, Bleaching and Finishing.

Shell Rolls.
Cohoes Foundry & Mach. Co. Cohoes, N. Y
Thurston, A. G, & Son, Box 528, Fall River, Mass.

Shoddies.
See Wool Shoddies.

Shocks.
Rice, T. P., Mifflin St. Wharf, Phila.

Shuttles.
See Bobbins, Spools, Shuttles, Etc.

Shuttle Checks.
Victor Shuttle Check Co., Auburn, N. Y.

Silk Machinery.
Butterworth, H. W. Sons Co, Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Mason Machine Works, Taunton, Mass.
Rusden Machine Co., Warren, R. I.

Silo.
Schlichter, E. F. 321 Vine St., Philadelphia, Pa.

Singe Plates.
Butterworth, H. W. Sons Co., Philadelphia.
Taunton-New Bedford Copper Co., New Bedford, Mass.

Singeing Machines.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Bros. (Albert Birch). Somerville. Mass.
Butterworth, H. W. Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Ms.
Granger Foundry & Machine Co., Providence, R. I.
Rusden Machine Co., Warren, R. I.

Sizing, Starch and Gums.
Arabol Mfg. Co., 155 William St., New York.
O. K. Soap Co., 968 Franklin St., Phila.
Stein, Hirsch & Co, 165 Duane St, New York.

Slashers.
Cohoes Foundry & Machine Co, Cohoes, N. Y
Lowell Machine Shop, Lowell, Mass.
Phillips The Thomas, Co., Providence, R.I.

Smoke Prevention.
Steam Boiler Equipment Co., 20 West Houston St., New York.

Soaps.
India Alkali Works, Boston, Mass.
O. K. Soap Co., 968 Franklin St., Phila.

Spindles.
Bamford & Smith, Pascoag, R. I.
Buckley, Benj's, Sons, Gun Mill, Paterson, N. J.
Draper Company, Hopedale, Mass.
Easton-Burnham Co., Pawtucket, R. I.
Ward & Undergrift, Elmer, N. J.
Whitin Machine Wks, Whitinsville, Mass.

Spindle Tubes.
Bamford & Smith, Pascoag, R. I.

Spinning Cylinders.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Spinning Frames.
See Cotton Machinery.

Spinning Rings.
Draper Company, Hopedale, Mass
Whitinsville Spinning Ring Co, Whitinsville, Mass.

Spinning Tubes.
Buckley, Benj's. Son, Gun Mill, Paterson, N. J.

Spools. *See Bobbins, Spools Shuttles, Etc.*

Spool Cotton for Mfrs. Use.
Warren, W. Thread Works, Westfield, Mass.

Spooler Knotter.
Barber & Colman, 11 Pemberton Sq., Boston.

Sprinklers
International Sprinkler Co., Philadelphia, Pa.

Stamps for Hosiery.
Atlas Copper Stamp Works, 15 Whitehall St., N. Y.
Wells, Wilfred, 505 W. Lehigh Ave., Philadelphia.

Steam Boilers.
Babcock & Wilcox Co., The, 29 Cortland St., New York City.
Brown, C. H, & Co, Fitchburg, Mass.

Steam Boiler Insurance.
Hartford Steam Boiler Inspection & Insurance Co, Hartford, Conn.

Steam Engines.
American Blower Co., Detroit, Mich.
Brown, C. H, & Co, Fitchburg, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Hooven (The), Owens & Rentschler Co Hamilton, O.
Rusden Machine Co., Warren, R. I.
Sturtevant, B. F. & Co., Boston.

Steam Meter.
St. John, G. C., 143 Liberty St., New York.

Steam Surface Coverings.
Keasbey, Robert A., New York.

Steam Specialties.
Butterworth, H. W. Sons Co., Philadelphia
Jenkins Bros., New York.
Rusden Machine Co., Warren, R. I.
Steam Boiler Equipment Co., 20 West Houston St., New York.
Sterling Blower & Pipe Mfg. Co, The, 44 Huyshope Ave, Hartford, Conn.
St. John, G. C., 143 Liberty St., New York.
Sturtevant Co., B. F., Boston.

Steam Valves.
Jenkins Bros., New York.

Stop Motion for Looms.
See, also, Warp Stop Motion.
Tucker Stop Motion Co., Winsted, Ct.

Tanks, Tubs and Vats.
Davis, G. M. & Son, Palatka, Fla.
Cypress Lumber Co, Apalachicola, Fla.
Hoag, A. W. & Co., Reading, Pa.
Lewis, H. F. & Co., New Orleans, La.
Rusden Machine Co. Warren, R. I.

Schlichter, E. F., 321 Vine St., Philadelphia. Pa.
Stearns, A. T. Lumber Co, Neponset, Mass.
Stevens, D. B. & Co., Auburn, Me.
Woolford, George, 2340 No. 9th St, Phila, Pa.

Tapes, Braids and Edgings.
Barton, F. C., 54 Franklin St., New York.
Cathcart, John, & Co, 115 Franklin St, N. Y
Chapin, Geo. W. Philadelphia Pa.
Friedberger Mfg. Co, Germantown, Pa.
Hamilton, J. H. & Co., 84 Franklin St., N. Y.
Krout & Fite Mfg. Co., Allegheny Ave. and Emerald St., Philadelphia.
Rheinstrom, R. A., 176 West York St., Philadelphia, Pa.
Weimar Bros, 1817 East York St, Phila, Pa.
Young, Wm. M., 2421 Mascher St., Philadelphia, Pa.

Temples.
Draper Co., Hopedale, Mass.

Tension Pulleys.
Arguto Oilless Bearing Co, Wayne Junction, Phila.
N. E. Ventilating & Heating Co, 980 Manton Ave, Providence, R. I.

Tentering Machines.
See Dyeing, Bleaching Machinery, Etc.

Tenter Clips.
See Dyeing, Drying, Bleaching and Finishing Machinery.

Testing Machines.
Howard, Geo. C., Lansdowne, Pa. and 2123 Market St., Philadelphia, Pa.

Textile Schools.
See Schools.

Thread Board for Spinning & Twisting Frames.
Houghton, L. T. Worcester, Mass.

Thread Protectors.
Ring Frame Faread Protector Co., The, Amsterdam, N. Y.

Tickets and Labels.
Saranac Electrical Mfg. Co., St. Joseph, Mich.

Tower Clocks.
Howard E. Clock Co., 403 Washington St., Boston; 41 Maiden Lane, New York.

Turbine Governors.
Replogle Governor Works, Akron, O.

Turbines.
(See Water Wheels.)

Twine Machinery.
Brownell, G. L., Worcester, Mass.

Twisting Machinery.
Brownell, G. L., Worcester, Mass.

Valves—Rubber.
Boston Belting Co., Boston, Mass.

Ventilating Apparatus.
Allington & Curtis Mfg. Co., Saginaw, Mich., 81 Wareham St., Boston.
American Air Moistening Co., Boston
American Blower Co., Detroit, Mich.
Berry, A. Hun, 23 W. 1st St, Boston, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Hartford Blower Co., Hartford, Conn.
Massachusetts Fan Co., Exchange Bldg., Boston.
New England Ventilating & Heating Co, Providence. R. I.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Philadelphia Textile Machinery Co, Hancock St, above Lehigh Ave, Phila, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
The Sterling Blower & Pipe Mfg. Co., 44 Huyshope St, Hartford, Conn.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Warp Stop Motions.
Draper Co., Hopedale, Mass.

Washers (Cloth).
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Brothers (Albert Birch), Somerville, Mass
Butterworth, H. W. & Sons Co., Philadel.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass
Kenyon, D. R., & Son, Raritan, N. J.
Phillips Co, The Thomas, Providence, R. I.
Rusden Machine Co, Warren, R. I.

Washing Soda.
Ford, J. B. Co., Wyandotte, Mich.

Watchman's Clocks.
Eco Magneto Clock Co, 620 Atlantic Ave, Boston.
Howard, E. Clock Co., 403 Washington St., Boston, Mass., 41 Maiden Lane, New York.
Nanz & Co, 127 Duane St., New York.
Riggs & Brothers, 310 Market St., Philadelphia, Pa.

Water Purifiers & Filters.
Automatic Water Purifying Co., 45 Broadway, N. Y.
Scaife, W. B. & Sons, Pittsburg, Pa.

Water Wheels.
Hunt, Rodney, Machine Co, Orange, Mass.
Leffel, James, & Co, Springfield, O.

Water Wheel Governors.
Cohoes Foundry & Machine Co, Cohoes, N. Y.
Leffel, James & Co, Springfield, Ohio.
Replogle Governor Works, Akron, O.

Winders. (Back.)
Taylor, Jas., 835 Arch St., Philadelphia.

Winder Bobbins.
Sweet & Doyle, Cohoes, N. Y.

Winders. (Hosiery.)
Altemus, W. W. & Son, Philadelphia.
Foster Machine Co., Westfield, Mass.
Lever, Oswald, Lehigh Ave. and Mascher St., Philadelphia.
Universal Winding Co, 95 South Street, Boston.

Wood Pulleys.
Chase Pulley Co., Providence, R. I.
Dodge Mfg. Co., Mishawaka, Ind.
Hoag, A. W. & Co., Reading, Pa.
Saginaw Manufacturing Co, Saginaw, Mich.

Wool Cleaning Compound.
Ford, J. B. Co., Wyandotte, Mich.
India Alkali Works, Boston.

Wool Combing Machinery.
Leigh, Evan A. 35 Mason Bldg., Boston.

Wool and Waste Dusters.
Atlas Foundry and Mch. Co., Newark, N. J.
Gerry, Geo, & Son, Athol, Mass.
Sargents', C. G., Sons, Graniteville, Mass.
Smith, Jas. Woolen Machinery Co., Phila.

Woolen and Worsted Machinery.
Altemus, W. W. & Co, 2816 N. 4th St, Phila, Pa.
American Tool and Machine Co., Boston.
Arguto Oilless Bearing Co, Wayne Junction, Phila.
Arlington Mch. Works (Arthur Birch), Arlington Heights, Mass.
Atlas Foundry and Mch Wks., Newark, N. J.
Birch Brothers (Albert Birch), Somerville, Mass.
Butterworth, H. W. Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Mass.
Fales, L. F, Walpole, Mass.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Furbush, M. A. & Son Machine Co, Phila, Pa.
Howard, Geo. C., Lansdowne, Pa. and 2123 Market St., Philadelphia, Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Kenyon D. R. & Son, Raritan, N. J.
Leigh, Evan A. 35 Mason Bldg, Boston.
Lever, Oswald, Lehigh Ave. and Mascher St., Philadelphia, Pa.
Lowe, Stephen C., 186 Devonshire St., Boston. Agt. John Hetherington & Sons, Ltd.
Parks & Woolson Machine Co., Springfield, Vt.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Philadelphia.
Phillips Co. The Thomas, Providence, R. I.
Rusden Machine Co., Warren, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Schofield, Geo. L., Philadelphia.
Smith, Jas. Woolen Machinery Co., Phila.

Wool Shoddies.
Becker, C. W., Agt., Amsterdam, N. Y.
Riverdale Woolen Co, Northbridge, Mass.
Slack, Wm. H. H., & Bro, Springfield, Vt.

Wool Washing, Preparing and Drying Machinery.

Hunter, Jas. Machine Co., No. Adams, Mass.
Phillips Co, The Thomas, Providence, R. I.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Phila.
Sargent's, C. G, Sons, Graniteville, Mass.
Smith, Jas. Woolen Machinery Co., Phila.

YARNS, THREADS, ETC.

Banding.

Moore, C. & Co, 12 S. 5th St, Phila, Pa.
Warren, W, Thread Works, Westfield, Mass.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
Whittier Mills, Chattahoochee, Ga , Treasurer's Office, Springfield, Mass.

Cotton Yarns.

American Cotton Yarn Exchange, 67 Chauncy St., Boston.
Barnesville, Mfg. Co., Barnesville Ga.
Buckingham & Paulson, 83 Leonard St. New York.
Catlin & Co, New York and Boston.
Charles, W. B., Amsterdam, N. Y.
Dana Warp Mills, Westbrook. Me.
Dexter Yarn Co., Pawtucket, R. I.
Dodds, J. S., 517 Wool Exchange, New York.
Eddy & Street, Providence, R. I.
Spring St., N. Y.
Eichmann & Sternberg, New York.
Grant Yarn Co, Fitchburg, Mass.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Indian Orchard Co., Indian Orchard, Mass.
Jenckes, E., Mfg. Co., Pawtucket, R. I.
Mitchell, Jas. E. & Co, Boston and Phila, Pa.
Moeller & Littauer, 109 Greene St , New York.
Montgomery, J. R, Co, Windsor Locks, Ct.
Monument Mills, Housatonic, Mass.
Morgan, E. A., 54 Franklin St., N. Y.
Orswell Mills, Fitchburg, Mass.
Salkeld, A. D. & Bro., 66 Leonard St., N. Y.
Tucker & Cook Mfg. Co, Conway, Mass.
Whittier Mills, Chattaeoochee, Ga., Treas. Office, Springfield, Mass.

Cotton Yarns Wool Spun.

Broadbent, J. & Sons, Unionville, Conn.

Flax. Hemp. Jute and Ramie.

Fawcett, Hughes, 115 Franklin St., N. Y
Eichmann & Sternberg, 530 Broadway, N. Y.
Morgan, E. A., 54 Franklin St., N. Y.

Gassed Yarns.

Dodds, J. S., 517 Wool Exchange, New York.
Eichmann & Sternberg, New York.
Greene & Daniels Mfg. Co, Pawtucket, R. I.

Glazed Yarns.

Eichmann & Sternberg, 530 Broadway, N. Y.
Indian Orchard Co., Indian Orchard, Mass.
Lorimers, Wm. H. & Sons Co., Philadelphia.
Malcolm Mills Co, Frankford, Pa.
Orswell Mills, Fitchburg, Mass.
Rockwell, E. M, Leominster, Mass.
Salkeld, A. D. & Bro., 66 Leonard St., N. Y
Skerry, A T, & Co, 47 Leonard St, N. Y.
Walcott & Campbell Spinning Co, New York Mills, Oneida Co. N. Y.
Warren, W, Thread Works, Westfield, Mass.
Whittier Mills, Chattahoochee, Ga., Treasurer's Office, Springfield, Mass.

Mercerized Yarns.

Dodds, J. S., 517 Wool Exchange, New York.
Eichmann & Sternberg, 530 Broadway, N. Y.
Harper, E. J., 395 Broadway, New York.
Indian Orchard Co., Indian Orchard, Mass.
Lorimer, Wm. H. & Sons Co , Philadelphia.
Montgomery, J. R. & Co., Windsor Locks. Conn.
Morgan, E. A., 54 Franklin St., N. Y.
Pennypack Yarn Finisning Co., Holmesburg, Pa.

Mohair Yarns.

Cranston Worsted Mills. Bristol, R. I.
Montgomery & Co, J. R, Windsor Locks, Ct.
Morgan, E. A., 54 Franklin St., N. Y.
Warren, W. Thread Works, Westfield, Mass.
Whittier Mills, Chattahoochee, Ga., Treasurer's Office, Springfield, Mass.

Harness Twine.

Cranston Worsted Mills, Bristol, R. I.
Eichmann & Sternberg, 530 Broadway, N. Y.
Fawcett, Hughes, 115 Franklin St., N. Y.
Moore, C., & Co., (S. W. cor. 5th and Market Sts.)
Morgan, E. A., 54 Franklin St., N. Y.
Warren, W, Thread Works, Westfield, Mass.
Whittier Mills, Chattahoochee, Ga., Treasurer's Office, Springfield, Mass.

Hosiery and Knitting Yarns.

Boyer, B. F. Co., Camden, N. J.
Broadbent, J. & Sons, Unionville, Conn.
Cranston Worsted Mills, Bristol, R. I.
Dexter Yarn Co., Pawtucket, R. I.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Herbst, Albert & Co., E. Allegheny Ave. Philadelphia.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Jenckes, E., Manufacturing Co, Pawtucket, R. I.
Mitchell, James E, & Co, Phila. and Boston
Monument Mills, Housatonic Mass.
Moeller & Littauer, 109 Greene St., New York.
Queensbury Mills, Worcester, Mass.
Skerry, A. T, & Co., 47 Leonard St., N. Y.

Novelty Yarns, Tinsels, Silk Noils, Etc.

Cranston Worsted Mills, Bristol, R. I
Eichmann & Sternberg, 530 Broadway, N. Y
Indian Orchard Co., Indian Orchard, Mass
Malcolm Mills Co, 229 Chestnut St, Phila, Pa
Moeller & Littauer, 109 Greene St., New York.
Montgomery & Co, J. R, Windsor Locks, Ct.
Skerry, A. T, & Co, 47 Leonard, St, N. Y.

Silk Yarns.

Cheney Bros, S. Manchester and Hartford Ct.
Eddy & Street, Providence, R. I.
Eichmann & Sternberg, 530 Broadway, N Y.
Moeller & Littauer, 109 Greene St., New York.
Ryle, Wm, & Co, 54 Howard St, N. Y.

Woolen and Merino Yarns.

Boyer, B. F. Co., Camden, N. J.
Broadbent, J. & Sons, Unionville, Conn.
Eaton Rapids Woolen Mills, Eaton Rapids, Mich.
Eddy & Street. Providence, R. I.
Harper, E. J., 395 Broadway, New York.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Jenckes, E. Mfg. Co., Pawtucket. R. I.
Moeller & Littauer, 109 Greene St., New York.
Rockwell, E. M, Leominster, Mass.
Salkeld, A. D. & Bro., 66 Leonard St., N. Y.
Skerry, A. T. & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Speed, James, 170 Summer St , Boston.

Worsted Yarns.

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Boyer, B. F, & Co, Camden, N. J.
Campion, Richard, 17 Bank St., Phila.
Cranston Worsted Mills, Bristol, R. I.
Croft, Howland, & Sons, cor. Broadway and Jefferson Ave., Camden, N. J.
Goff, D. & Sons, Pawtucket, R. I.
Harper, E. J., 395 Broadway, New York.
Herbst, Albert, & Co., E. Allegheny Ave., Philadelphia.
Moeller & Littauer, 109 Greene St., New York.
Pocasset Worsted Co., Thornton, R. I.
Queensbury Mills, Worcester, Mass.
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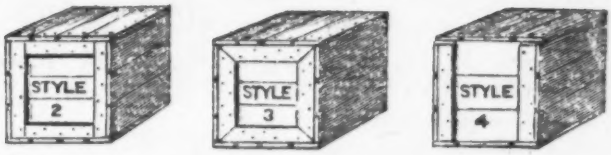

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The advertisers in the following columns should be addressed in care of TEXTILE WORLD or inquiries concerning them may be addressed directly to "Information Department TEXTILE WORLD," as full particulars of each advertiser are on file, and the addresses of suitable agents, superintendents and foremen for every branch of the textile industry will be furnished to manufacturers.

Any subscriber may file his application, and no charge is made until position is secured.

The business of this department is held strictly confidential.

The applications of good overseers in every department, who are in want of positions are solicited.

Manufacturers are invited to use this department when in need of skilled men; each case will be handled confidentially, with promptness and judgment, and without charge to manufacturers.

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1750 **Wanted.** Position as superintendent of cotton mill by a practical carder and spinner. First-class references from former and present employers.

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1806 **Wanted.** A position as supt. by an up-to-date man full of push and energy. A hustler and a good manager Anyone needing a man to manage their mill will do well to correspond with him. Is up in woolen manufacture of flannels, blankets and jeans; in cotton of drills, sheetings, shirtings and cotton or jute bagging. Wages from $3 to $4 per day and house rent free. Has had long experience on above goods, especially in weaving.

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1938 **Supt.** or Supt. and Designer. Age 33; Scotch; married. Fine and plain fancy ginghams, shirtings, fine sheer fabrics, cotton and worsted dress goods, plain and Jacquard silks and Jacquard bed quilts, also print cloths. Crompton & Knowles looms. All kinds of winding, beaming, warping and quilting machinery, also finishing. At present studying picking, carding an spinning machinery.

1957 **Supt.** of cotton cloth or yarn mill, 37 years old, English, married, is open to a position. Thoroughly familiar with coarse and fine yarns up to 150s. Best of references. Will go to any part of the United States.

1772 **Supt. or Overseer of Weaving.** Age 38; American; married. Lawns, fine sheetings and shirtings, sateens, twills, fancies, denims and cottonades. Is familiar with Whitin, Lowell, Draper, Northrop and English machinery. Not at present employed.

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1930 **Asst. Supt.,** woolen or worsted, or overseer of twisting, spooling, dressing. Age 40; American; married. Is familiar with English and American machinery. Excellent references.

1924 **Assistant Supt.,** boss weaver and boss dresser desires a position in a woolen mill 39 years of age; an American; married. Has worked on all classes of woolen goods on both English and American machinery. Good references from former employers. 15 years' experience.

1974 **Asst. Supt.** or Designer, woolen or worsted, who understands designing and also the work of every department. Has worked on fine worsteds, coverts, cheviots kerseys, meltons and fancy cassimeres. Technical education acquired at Phila. Textile School. Six years' practical experience, three as designer. Age 24, American, good references. Will go anywhere

1936 **Supt. or Designer,** an American, married. 38 years of age, is desirous of obtaining a position. Understands the manufacture of worsteds, cotton worsteds, cassimeres, meltons—steam face, flannels, and horse and bed blankets. Long experience and up-to-date in methods. Moderate wage.

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1983 **Supt. and Designer** of woolen and worsted dress goods or men's wear, is open to a position. 42 years old; American citizen of German extraction. Familiar with jacquard work as well as dobby. Good references.

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1270 **Boss Carder** (and spinner, if desired) in an underwear or hosiery mill. Fine and heavy wool and cotton. German; age 34. First class man in every respect. Excellent references.

1617 **Boss Carder or Second Hand.** Has held several first-class jobs also has had experience in spinning. Can accept position at once. All grades of stock, including shoudies, and cotton and wool and all wool.

1977 **A Boss Carder** who understands both English and American cards on almost all grades of stock, desires a position. 30 years old, Swedish-American, single. Is a steady, reliable man, and a good carder. Terms reasonable.

1944 **Carder,** or carder and spinner. Age 48; unmarried; American. Has worked on all kinds of woolens, and of late on shoddy and cotton mixes. Is familiar with Davis & Furber machines. Excellent reference from past employer.

COTTON CARDERS.

1968 **Overseer** of cotton carding and combing, who understands setting up and starting new machinery, is open to a position. 33 years old, English, married. Is especially good on fine combed Egyptian and Sea Island yarns. Best of references. Moderate wage.

1817 **Chief Engineer or Master Mechanic.** First class man for a cotton mill. Has been employed as machinist in various cotton mill repair shops, and in repair shops building new cotton machinery. Proficient as a draftsman on mechanical drawing. 33 years old; married.

1919 **Overseer Cotton Carding and** Spinning, who has had an experience of over 10 years in N. E. and New York mills, is open to a position. 26 years old; American; single. Thoroughly competent and reliable. Best of references.

1931 **Overseer of Carding and Combing;** 33 years old; American; single. Has worked on all classes of fine combed work; both American and English machinery. Can take place immediately. 12 years in a large New England mill.

1932 **Overseer of Carding** or would take assistant superintendent position. Age 27; American; single. Carded and combed American, Egyptian and Sea Island Cotton, making yarns from 8s to 100s; both plain and colored goods. Can come at once

1718 **Overseer of Card Room** desires a position in cotton mill. About 26 years of age, steady and strictly temperate. Has been six years second hand and two years overseer. Best of references

1991 **Secondhand Comber** or Carder who is at present handling 75 cards and eight combs, is open to a position. 30 years old, French, married. Is familiar with all well known makes of machinery. Good references. Terms reasonable.

WOOLEN SPINNERS.

1927 **Overseer Spinning,** carding or flyers. 37 years old; married, and can furnish best of references. Twenty-three years' experience. A German.

1969 **Overseer** of woolen spinning would like a position in a good mill. Has worked on woolen, cotton mixes, and shoddies from 1 to 3 8s. 26 years of age, temperate and steady. Good references.

1987 **Overseer** of woolen spinning desires to make a change. Is familiar with suiting, union, cassimere, satinet and knitting yarns and all ordinary makes of machinery. 30 years of age; American; married. Good references as to character and ability.

1956 **Overseer Woolen Spinning,** 34 years old, American, married, desires position. Understands Johnson & Bassett, Davis & Furber, Cleveland Bros. and Woonsocket mules; and has made all wool, merino and shoddy mixes. Can give good references.

1941 **Boss Spinner.** Wants $3.50 or more. One daughter a spooler and twister. Excellent references. Is familiar with Davis & Furber, Johnson & Bassett, and other makes of machinery.

COTTON SPINNERS.

1960 **Overseer of Cone Winding** and spooling or ring spinning, who understands Universal, Foster, Broadbent and Payne winders, and Whitin and Mason frames, desires a position. Has worked on carded and combed yarns from 4s to 160s; also, mercerized, gassed and bleached yarns from 2 to 8 ply. Young man; American; married, and can give satisfactory references from large mills.

1950 **Overseer** or second-hand of cotton mule spinning desires a position in the Southern States at reasonable wages. Is a good fixer and has made yarns ranging from 4s to 40s. 39 years old; German; married. Best of references. One worker in family—drawer in.

1915 **Overseer of Ring Spinning,** or carding, would like a position in a cotton mill. Is familiar with fine and coarse yarns and almost all American machinery. An American; 33 years of age; married. Best of references.

1784 **Worsted Drawer and Spinner.** Would take twisting. Age 2-; English; single. Can furnish references as to ability and character.

1519 **Overseer Spinning.** Age 31; American; married. Has worked on yarns from one run to 5½. Will accept an average salary. At present employed, but wishes to better himself.

1986 **Overseer** of cotton spinning, who has worked on yarns ranging from 40s to 180s white and colored, is open to an engagement. Is familiar with Howard & Bullough, Saco & Pettee, Fales & Jenkes, and Lowell frames. 33 years old; American; married. Good references.

1984 **A Secondhand** of mule spinning would like a position in a cotton mill. 24 years of age; American. Is familiar with almost all kinds of stock and thoroughly understands Mason mules. Best of references. Is willing to go South.

WOOLEN WEAVERS.

1937 **Boss Weaver.** Can furnish excellent recommendations. Is a first class man on all kinds of fancy woolen goods, and is thoroughly posted on Crompton & Knowles looms. Wants a place at $2.75 or $3.00 per day. Will go anywhere. Age 39; American married.

1940 **Boss Weaver or Designer,** or could fill a position as all around man in a small mill. Age 42; Scotch; married. Worked on fancy cashmeres, blankets, flannels, carriage robes, and other fancy goods. Is familiar with Crompton & Knowles, Davis & Furber, and other looms. Wants to go West or South.

1947 **Boss Weaver,** designer or superintendent. American; married; age 36. Fancy cassimeres and worsted cloakings; most all grades of goods for ladies' and gents' wear. Crompton & Knowles and Davis & Furber looms and Jacquard.

1959 **Boss Weaver,** who is familiar with cotton, woolen and worsted looms, and all classes of goods, is open to a position in a large mill. 46 years of age; American; married. Strictly temperate and is recommended by some very large N. E. woolen and cotton mills.

1964 **Boss Weaver,** familiar with all makes of woolen and worsted machinery, and who has worked on ladies' dress goods and men's wear, desires a position. 39 years of age; American; married. Can give good references.

1949 **Boss Weaver,** capable of taking entire charge of a small woolen mill, will be open to a position in a few weeks. 44 years old; American; married. Familiar with all classes of woolen and worsted goods. Good references. Three workers in family.

COTTON WEAVERS.

1992 **Boss Weaver** who also understands the management of drawing-in, pattern and slasher rooms, is open to a position. Is familiar with all ordinary makes of cotton looms and has handled ginghams, Shirtings, dress goods, etc. 36 years old, American, married, Good References

1985 **Overseer** of cotton weaving, thoroughly familiar with the weaving of cotton duck, sheetings, drills, twills, stripes, osnaburgs, and all plain goods is open to a position. Understands Lowell, Crompton & Knowles, Draper, Lewiston, Whitin, Bridesburg, English and Clipper looms, and several other makes. 34 years of age, American, married. Terms reasonable. Good references.

1826 **Wanted by Steady, Industrious** man, a situation as overseer, in Tape mill. Has had considerable experience, but does not know everything, but willing to improve. $2.25 per day. Has been overseer a short time, and has perfect control of help. Age 46; English; married. No family. Would go anywhere, and settle

1482 **Weaver or Wool Sorter.** Has worked on cassimeres, cheviots, tricots, kerseys and cloakings. Good references.

1536 **Boss Weaver or Superintendent.** Age 43; married; American. Can run any department in woolen mill, having been in business for himself. Not at present employed. Can take position immediately.

KNITTERS.

1943 **Fixer or Foreman.** Age 27; American; married. Has had five years' experience on knitting machines, including Standard B and C machines, can handle new Victor machines, also sewing machines. Wants to change on account of location.

1945 **Asst. Supt.,** or overseer of a large stitching department in knit underwear mill. Willcox & Gibbs sewing machines, Union Special and loopers.

1989 **Boss Knitter,** underwear, who has had a wide experience on wool, worsted, silk, lisle and cotton mixed underwear, is open to a position. Familiar with McMichael & Wildman, Nye & Tredick, Snyder & Fisher, Stafford & Holt, ribbed machines; Tompkins, Campbie & Clute, spring needle. 34 years old, German, married. Good references.

1961 **Supt. or Manager** of large hosiery yarn mill will be open to a position shortly American; married. Has manufactured in the South hosiery yarns in natural state, mixtures, silver grays, bleached and colored. Can refer to influential men.

1951 **Overseer** of cuff knitting, who thoroughly understands fixing Tiffany and Cooper machines, wishes position. 45 years of age; English; married. Good references.

1939 **Boss Knitter.** Age 42; English descent; married. Has one girl who is a winder. 11 years as foreman knitter in one mill, and for the past seven years in full charge of knitting and winding in a mill, but wants to change on account of locality. Campbell & Clute, Tompkins and Crane machines. Balbriggan underwear, fleece lined and two-thread work, also fancies. Worked mostly on woolen goods.

1824 **Boss Knitter or Fixer** on ribbed underwear. Has worked on fancies, double knees and tops and plain work. Is familiar with Brinton & Denny, McMichael & Wildman, Huse and Pepper machinery Will work for $2.50 or more, according to position.

1906 **Supt. or Agent** of a hosiery mill is open to a position. Thoroughly understands spinning, dyeing and is familiar with all well-known makes of knitting machinery. American; 28 years old; single. Has been superintendent for the last seven years in a large plant. Best of references.

1971 **Foreman** of men's underwear who is familiar with Nye & Tredick, Snyder & Fisher machines, etc., is open to a position. Thoroughly understands cutting. Age 35, American, married. Is a steady, competent man and understands his business. Good references.

1973 **A Boss Knitter** on ribbed underwear, cotton or wool, is open to a position. 27 years old, French Canadian, married. Has been boss knitter in the United States for several years, and can give good references. Thoroughly familiar with all well-known makes of ribbed underwear machines. Wants $3 per day.

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DYERS.

1972 **Boss Dyer** of large experience on cotton, cotton and wool, shoddy waste, camel hair raw stocks; all wool flannels, ladies' dress goods, worsteds, friezes and Union piece dyes; and skein dyeing, hosiery, etc., is open to a position in a woolen, worsted or hosiery mill. 50 years of age, English (naturalized), married. Best of references. Terms moderate.

1978 **Asst. Chemist** in laboratory of a mill or dyestuff house. Has taken course in chemistry and dyeing in Georgia School of Technology, Atlanta. Has had experience in the dyehouse of one of the largest southern cotton mills and second-hand in dyehouse of a large woolen mill. 21 years of age, American, steady and well informed in this line of work. Will start for moderate wages.

1979 **A Boss Dyer**, who has been assistant dyer in one of the largest mills in the United States for the last ten years, is desirous of making a change. Is familiar with wool slubbing, worsted yarn, and pieces; cotton raw stock, skein and warp yarn, pieces, and also Union goods. Understands all modern dyeing machinery. Best of references. Salary moderate.

1966 **A Color Mixer**, chemist or cotton piece dyer is open to a position. English; 30 years old; married. Was assistant manager of large print works in England for three years, and can refer to well-known men. Terms moderate.

1505 **Boss Dyer.** 11 years experience coloring according to the requirements of the trade, on all kinds of wool, worsted yarns, worsted piece dyes, cotton warp worsted piece dyes, cotton and shoddy piece dyes, shoddy, raw cotton and cotton yarns. Willing to work for reasonable wages.

DESIGNERS.

1923 **Assistant Designer** on woolen or worsted dress goods and suitings is open to a position. Age 21; American; single. A graduate of one of the largest textile schools in the country, and has had experience in a good New England mill. Also understands flannels and satinets. Good references.

1897 **A Young Man**, 28 years of age, competent to handle the designing for a cotton or silk mill, would like a position. Has made in cotton, plain, fancy and leno; in silk, tie silks, dress goods and linings. Looms, all well-known makes. Is Scotch, and single. 14 years' experience in weave room and designing room. Good references from N. J. and Conn. mills. Four workers in family—weavers.

1962 **Designer**, boss weaver, or both, desires a position in a woolen or worsted mill. Is at present employed as designer and boss weaver on worsted and woolen dress goods and suitings, and giving satisfaction. 30 years old; Swede; married. Expects moderate salary. Will go to any part of the United States. References from well-known textile men.

1773 **Designer** of worsteds and cottons is open to a position. Has worked on suitings, vestings, worsteds, fancy Jacquard work on narrow fabrics and dress goods. Understands English and Crompton & Knowles looms. About 25 years old, steady and strictly temperate. Good references. Terms moderate.

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FINISHERS.

1900 **Boss Finisher** of men's wear, ladies' dress goods, worsteds, cassimeres, kerseys, cotton and woolen mixes, who has gained his experience as finisher in some of the large English and American mills, is open to a position. Is familiar with all standard makes of finishing machinery; 48 years of age; Scotch; married. Can refer to well-known men.

1526 **Foreman of Finishing Room**, Folding Packing, etc. Age 45; married; English. Has worked on white and colored goods and prints. Is acquainted with every kind of machinery used in his business. Has worked 20 years in this country. Can give good references.

1990 **A Foreman** in Finishing room on all kinds of cotton piece goods. Accustomed to all kinds of folding, packing, etc., and machinery used therein. English, married, age 36. Five years in last situation. Has been in this country 12 years. Can give references from present and past employers

1921 **Boss Finisher** of a satinet mill or secondhand of a woolen mill, would like a position. Has held these positions in good sized mills, and is familiar with satinets and woolens. 23 years of age; American; single. Good references as to steadiness, reliability and quality of work.

1970 **A good Second-hand Finisher** who thoroughly understands Union cassimeres, meltons and satinets, would like a position. 30 years of age, American, married. Well up on all well-known makes of machinery, and capable of taking a boss job. Good references. Reasonable wages expected.

MISCELLANEOUS.

1994 **Wanted** a position in either mill or selling office of a textile manufacturing business by an American of extensive practical and theoretical knowledge in all textile branches, well versed in German and French. Age 28 years. Can furnish best of references.

1988 **A Young Man,** 23 years of age; American; who has had 18 months' experience in a woolen mill and is at present a student in a textile school, is willing to begin at the bottom of the ladder with a good mill where there is prospect of advancement. Small pay to start. Good references.

1980 **An Expert** on soap making and wool scouring will be open to a position shortly. Is familiar with the treatment of all grades. About 40 years old. English; married. Has worked for one concern in the United States for 12 years.

1981 **Master Mechanic;** 46 years of age; American; married; who has been employed in large cotton mills in the country is opened to a position. Is a practical man and thoroughly understands cotton machinery. Best of references from well known mill men.

1914 **A Young Man** who thoroughly understands the keeping of mill books would like a position in the Southern States or would go to Cuba or Puerto Rico. Is a first-class man and perfectly familiar with general office work. An American; 22 years of age; single. Steady and reliable, and can give good references.

1935 **First-class Twister** and Entering, 25 years' practical experience wishes steady position in country place.

1965 **A Second-class Engineer,** 48 years of age, American, would like a position as such in a N. E. mill. Is steady and reliable. Good references from former employers.

1873 **Wanted** situation as Master Mechanic in cotton corporation. Has had large experience. Middle aged; strictly temperate. A graduate of a technical school. Learned carpenter's trade and machinist's

1881 **Paymaster or Bookkeeper.** Agent or Manager Wood or Iron working plant or small cotton mill. 28 years' experience. Expert accountant. Can take charge of all the office work in large factory or do all myself in small factory. Good references. Will go anywhere in New England or Middle States.

1764 **Engineer and General Repair Man.** Age 45; American; married. Wants $2.50 to $3.00 a day. Over twenty years' experience.

1816 **Smart Designer,** high class worsteds and coatings and trouserings. Thorough experience leading factory. Now abroad; anxious to find employment in this country. Moderate start.

1890 **Manager or Supt.** of a woolen mill, who understands designing, is open to an engagement. 34 years old; Scotch, and single. Large experience in Scotch and Canadian mills on tweeds, worsteds, overcoatings, etc. Good references.

1835 **Beamer, Twister,** also understands drawing in and splitting. Age 27; American. Has worked on ginghams, dress goods, shirtings and cotton worsted.

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	Foreman Toolmaker		Stenographer
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USEFUL BOOKS.

Weave Lexicon for Harness Weaving. By Franz Donat, A. Hartleben, Wien. 160 pages; price $2.00.

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Practical Carder. By James H. Greer. Price 50 cents.

This book begins with a short description of the cotton plant and fibre, which is followed by chapters on the following subjects: Ginning; Baling; Opening and Mixing; Breakers and Lappers; Carding; Railway Heads; Drawing Frames; Slubbing and Roving Frames; Picking Department; Calculations for Cards, Railway Heads, Drawing Frames, Slubbing and Roving Frames.

It is of a handy size for the pocket, and will be found valuable to all engaged in cotton manufacturing.

The Students' Cotton Spinning. By Joseph Nasmith; 598 pages; price $3.00.

This is a standard work on spinning and treats of the following subjects: Evolution of Cotton Spinning; Varieties of Cotton; Mixing, Opening and Scutching; Carding; Card Clothing and Grinding; Combing and Drawing; Slubbing and Roving; The Theory of Spinning; Mule Spinning; Ring Spinning; Reeling; Winding and the Manufacture of Thread; Waste Spinning; Arrangement of Drafts and Production.

Science of Colour Mixing. David Paterson; 124 pages; price $3.00.

The author of this book, who is a dyer, has treated in a very practical manner the science of mixing ordinary colors and dyes thus producing a work that should be in the hands of every dyer and colorist. There are five colored plates showing the various colors and effects produced by mixing them. The book also contains eleven dyed samples together with recipes.

Woolen and Worsted Manufacture. By Robert Beaumont; 386 pages; price $2.00.

The following is a brief outline of the contents given by chapters: 1, Materials; 2, Woolen Thread Manufacture; 3, Worsted Thread Construction; 4, Yarns and Fancy Threads; 5, Loom-mounting; 6, Principles of Cloth Construction; 7, Hand Looms; 8, Power Looms; 9, Weave Combinations, Drafting; 10, Pattern Design; 11, Color Applied to Twilled and Fancy Weaves; 12, Backed and Double Cloths; 13, Analysis of Cloths and Calculations; 14, Cloth Finishing.

Practical Cotton Calculations. Ernest Whitworth; price $1.00.

This work is a handbook containing a large amount of useful information relating to cotton yarn, cloth structure, loom and miscellaneous cotton mill calculations and written in a clear and concise manner. The author, who is a practical weaver and designer, has in this work sought to give mill men the information that is needed in every-day work and to exclude all matter not essential to this main object. The work is illustrated and contains many useful tables.

Spinning Woolen and Worsted. By W. S. B. McLaren; 251 pages; price $1.50.

This is a very practical work on the spinning of woolen and worsted yarns. The following is an outline of the table of contents: Nature of Wool; Wool Sorting; Wool Washing and Oiling; Difference Between Woolen and Worsted; Preparing and Carding for Combing; Wool Combing; Drawing; Worsted Spinning; Woolen Carding; Feeding, Condensing and Spinning; Twisting, Reeling and scouring.

Draw Frames and Fly Frames. By Thomas Thornley; 380 pages; price $3.00. This is the only work especially devoted to the drawing and roving processes, and is intended to benefit those who are directly concerned in the practical operation of the machines under discussion, with particular stress on the points which will give the best results from machines in their actual manipulation. Among the subjects treated may be mentioned the following: Drawing Frames; Fly Frames—Winding, Building Motion, Differential Motions; Roller Setting and Drawing; Defective Roving Bobbins; How to Put up Frames; etc.

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KROUT & FITE MFG. CO.,

Manufacturers of

SILK and COTTON NARROW FABRICS

Spool Tapes a Specialty.

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WEIMAR BROS., MANUFACTURERS OF

Silk, Cotton, Medium and Superfine, and Non-Elastic

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Medium and Superfine Tapes a Specialty.

2046 Amber St., Philadelphia.

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Selling Agent for the

HOFFMAN MANUFACTURING COMPANY,

Manufacturers of

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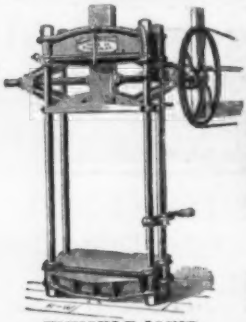
YARNS

SOLIS : : BOSTON.

179 Devonshire Street.

ANDREW J. SOLIS, Jr. & CO.



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BALING PRESSES

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EASTON AND BURNHAM MACHINE CO.,

Pawtucket, R.I.

ALL KINDS OF Spindles USED IN THE MANUFACTURE OF COTTON, WOOL & SILK

IMPROVED UPRIGHT SPOOLERS

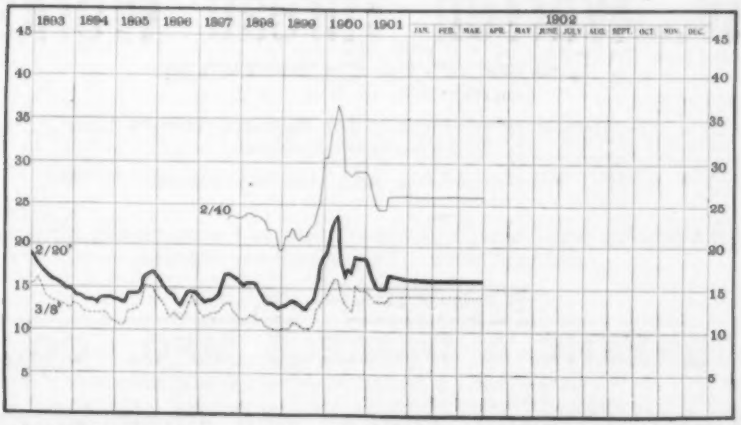
TO SPOOL FROM COP, SKEIN, OR BOBBIN.

Knitting and Weaving Yarns

Cones, Cops, Warps, Skeins,
Single, Double, Three-ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.

EDWARD S. HYDE, 223 and 225 Chestnut Street, Philadelphia, Pa.

YARN DEPARTMENT.



GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

Eastern Yarn Market.

The advance in the price of raw cotton has introduced a new factor into the yarn market and one that is very embarrassing for spinners. The price of yarn has not advanced in proportion to the increase in cost caused by the advance in the raw material. Yarn prices are somewhat higher, however, and buyers find the spinner very abrupt in his refusal to consider offers under market rates.

The spinners of both fine and coarse yarn see no way by which they can sell yarn at going rates, buying cotton on a basis of 9 cents for Middling Uplands; consequently, they are reduced to the alternatives of getting higher prices for their yarn or shutting down their mills.

There has been a disposition on the part of some knitters to place orders for yarn, as many of them believe that the prosperity of the country, together with the higher prices of raw cotton is bound to have its effect in active business in knit goods at remunerating prices and that the prices for yarn are likely to advance in the future. This disposition to purchase is, however, unfortunately not general, and has been confined to isolated firms. This gives the market an irregular appearance and as a general thing business has been quiet.

The demand for mercerized yarns, particularly warps, is better than for any other class of goods; mercerizers are fairly busy. In other respects, the weakest part of the market is found, as usual, in the cheaper grades, the reasons for which are too well known to need repetition here.

We quote as follows:

6s	15
8s	15
10s	15½
14s	16½
16s	17
22s	18½
24s	19
26s	19½
30s	20½-21½
34s	22-23½
36s	22½-23½
40s	23½-24½

On cones, ¾c. more up to 14s; 1c. more than 15s to 22s; 1¼c. from 23s to 35s, and 2c. above that.

Eastern Two-Ply Skeins, Carder Peeler.

12s	16½-17¼
14s	16¾-17½
18s	17¾-18½
20s	17¾-19
22s	18½-19½
26s	20-20¾
28s	20½-21¼
30s	21-21¾
36s	21½-22¼
40s	25½-26¼
45s	27½-28¼
50s	31½-32¼
55s	34½-35¼
60s	39½-40¼

Eastern Two-Ply Warps, Carder Peeler.

2/30s	21½-22¼
2/36s	23½-24¼
2/40s	25½-26¼
2/45s	28½-29¼
2/50s	32½-33¼
2/60s	40½-41¼

Egyptian Weaving Yarns.
Single Skeins Combed.

30s	30½-31¼
35s	32¼-33¼
40s	34½-35¼
45s	36½-37¼
50s	38½-39¼
55s	40¼-41¾
60s	43-43¾
70s	58-58¾
80s	66-66¾
90s	70½-71¼

W. Warren Thread Works,

SPOOL COTTON
on 100 to 12,000 yd. Spools or Tubes.

A Specialty of Thread for Manufacturers Use
on Spools, Tubes or Bobbins.

Also Seaming and Hosiery Yarns
on Cones, Tubes or Skein.

Our bleaching and dyeing facilities are new and unsurpassed for prompt and neat work. Correspondence solicited.

WESTFIELD, MASS.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

Colored and Bleached Yarns Furnished in any manner desired by the trade. **PAWTUCKET, R.I.**

MONUMENT MILLS,

Manufacturers of
White, Colored, Fancy and Double Twist

Cotton Warps

HOUSATONIC, MASS. 4s to 60s.

AMERICAN YARN PRINTING WORKS.

JOHN FORREST
Printer of Cotton, Woolen, Silk and Worsted Yarns and Warps for Woven and Knit Goods. Bleaching of Cotton and Woolen Yarns a Specialty. **134 to 150 North 22d St., Philadelphia, Pa.**

The J. R. MONTGOMERY CO.,

WINDSOR LOCKS, CONN.

Manufacturers of

Mercerized Cotton Yarns. GIVES THE HIGH SILK-LIKE LUSTRE IN KNIT GOODS AND WOVEN FABRICS

Novelty Yarns. BOUCLE, BOURETTE AND SPIRALS, IN COTTON, WOOL WORSTED, MOHAIR AND SILK.

Cotton Warps. ON BEAMS, JACK SPOOLS AND TUBES. IN FANCY TWIST COLORS AND PRINTED.

OIL SEEDS PRESSING CO.,

Manufacturers and Importers of

VEGETABLE OILS.

15 to 25 Whitehall Street, - - New York.

SAVOGRAN

CLEANS WOOL, FLOORS ANYTHING.
INDIA ALKALI WORKS, Boston.

Two and Three Ply Skeins, Combed.

30s	32-32¼
36s	34-34½
40s	36-36½
45s	36½-37½
50s	41½-42½
55s	45-46
60s	47-48
65s	52-53

Philadelphia Yarn Market.

There is not only the usual variation with the different mills and the different houses, but on Southern cones there is something a trifle more than the usual variation, as some agents are selling in a small way, yarn slightly lower than the list.

Spinners are generally standing firm, however, believing there is a positive loss in the year's run, even at the list price, with today's cotton.

We quote as follows:

Charlotte List.

7s and coarser	14½
8s and 9s	14¾

Southern frame cones (good quality):—

10s	15
12s	15¼
14s	15½
16s	16¼
18s	16¼
20s	17
22s	17¼
24s	17¾
26s	18½
30s	18¼-20¼
40s	25-25½
50s	31-32

Southern high grade mule yarn:—

Cones.

10s	15½
12s	16
14s	16½
16s	17
18s	17½

Southern high grade mule cones:—

20s and 22s	18-18½
24s	18½-19

Southern frame yarn, lower grades:—

6s and 8s	13½-14
10s	14½

Eastern cones (high grade quality):—

10s	16-16½
12s	16½-17
14s	17-17½
16s	17½-18
18s	18-19
20s and 22s	18½-19½

Lower grades, Eastern yarn:—

6s and 8s	14-14½
10s	14½-15

Rise ¼c. per number to 16s.

Besides this, there is some comber waste used, that is made into 8s and 10s cones and sold at 14½-15.

Skein yarn (mostly Southern):—

4s to 6s soft	14-14½
10s to 12s	14-14½
14s to 20s	14¼-15¼
22s	15¼-16
14/2	14¾-15
16/2	15-15¾

Buckingham, Paulson & Co.,
COMMISSION MERCHANTS.
COTTON YARNS of all Descriptions.
83 Leonard St., New York.
120 Chestnut Street, Phila. 520 5th Ave., Chicago. Ills
Cash Advances, Cash Sales and Prompt Returns. Consignments and correspondence solicited,

JAMES E. MITCHELL & CO.,
COMMISSION MERCHANTS.
COTTON YARNS
FOR ALL PURPOSES.
122-124 Chestnut St., PHILADELPHIA, PA.
Brown Building 185 Summer St., BOSTON, MASS

LINEN YARN IMPORTER.
Hughes Fawcett, 115 Franklin St., New York,
Flax, Hemp & Jute Line and Tow Yarns,
FOR WEAVING PURPOSES
Linen Jacquard Harness Twines.
Fine Cotton Harness and Heddle Twines.
For Cotton, Silk, Woolen and Carpet manufacturers. Correspondence solicited. Samples promptly furnished.

J. S. DODDS,
517 Wool Exchange, New York, N. Y

MERCERIZED YARNS
Two and Three Ply, for All Purposes,
In Peeler, Egyptian and Sea Island, gassed and ungassed, natural and dyed. Fast Black for cross dyeing a specialty.
Through H. A. CAESAR & CO.

A. D. SALKELD & BRO.
With
FRED'K VIETOR & ACHELIS.
YARNS,
66-72 LEONARD ST., NEW YORK.

MOELLER & LITTAUER,
IMPORTERS AND MANUFACTURERS OF
Silk, Worsted, Woolen, Cotton & Mohair Yarns and Tinsel. Chardonnet Artificial Silk.
Mercerized, Turkey-Red, Swiss Emb. Yarns.
109 Green St., NEW YORK.

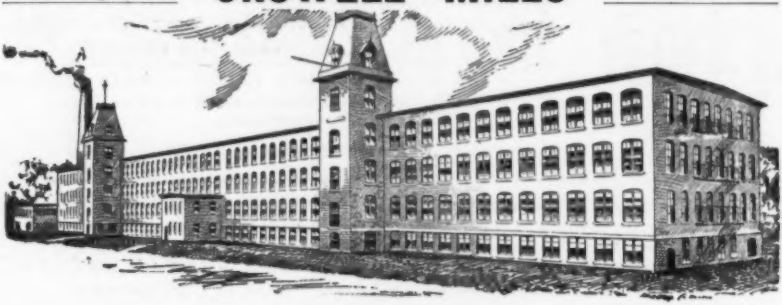
E. C. HARPER,
WORSTED AND WOOLEN YARNS,
MERCERIZED COTTON,
395 Broadway, New York.
Tel. 1828 Franklin.

Eddy & Street,
COTTON, WOOLEN, YARNS AND BRAIDS WORSTED, SPUN SILK.
PROVIDENCE, R. I.

CAPACITY,
50,000 Spindles.

ORSWELL MILLS

FITCHBURG
MASS.



COMBED OR CARDED

COTTON YARNS

In Chains and Skeins, on Balls, Beams, Spools—single or twisted.

WILLIAM FIRTH, PRESIDENT. FRANK B. COMINS, TREASURER

AMERICAN MOISTENING COMPANY,

150 Devonshire St., Boston, Mass.

The "Drosophore" and "Vortex" Humidifiers.

Over 20.000 of our HUMIDIFIERS in operation.

Highest award on the Recommendation of The
FRANKLIN INSTITUTE for

"SIMPLICITY and ORIGINALITY of DESIGN"

DANA WARP MILLS

Westbrook, Maine.

WHITE AND COLORED WARPS,

6s to 50s—Single and Ply.

MULE COPS,

from 30s to 50s from

AMERICAN AND EGYPTIAN COTTON.

Indian Orchard Company.

Cotton Warps and Yarns.
In gray and all Colors, Single or two or more Ply, and Cable Cord

Novelty Yarns.
in Various Patterns, Colors and Twists.

Carded and Colored Cotton.
For Mixing with wool; Machined or in Roving.

Indian Orchard, Mass.

J. Morgan, Pres. H. B. Wigg, Treas. W. C. Gaffney, Agt.

20/2	16-16½
30/2	18-18½
40/2	22-23
16/3 slack	16-16½
12/3 slack	15
8/3 carpet	14-14½

Skein yarn (mostly Southern):—

8/3 slack	14½
9/4 slack	14½

Warps (mostly Southern):—

14s to 16s	15-15½
20s and 22s	15½-16
26s	15½-16½
14/2	15-15½
16/2	15½-16
20/2	16½
24/2	17-17½
30/2	18-18½
40/2	22½-24
40/1	24-25

Mixed colored yarns (mock twist, half colors):—

6s to 10s	15-15½
12s to 14s	16-16½
16s to 18s	17-18

Silver and jaeger, 1½ to 2c. over white. Mock Egyptian, 3c. advance over white. Egyptian, 4c. to 5c. above best quality white.

Worsted Yarn.

Spinners are beginning to look for more orders, and are complaining at the slowness of weavers in placing further contracts. Many orders taken in November are not being filled on account of the non-arrival of spinning orders, and some mills who placed orders for yarn on the end of the boom at the highest prices are trying to get such orders canceled.

It cannot be said that yarn has declined in price, since the high prices asked by some spinners were not justified and were only based on the valuation caused by a short supply of spinning machinery and not on the advance or price of worsted wool. Very few weavers paid the prices quoted by spinners during the tail end of the boom.

The prices were made more to discourage ordering than with the expectation of securing orders at the prices asked. The spinners now who need orders are making prices which are within the reach of the weavers, but few new orders are being placed at this time, as the trade in many lines is late for business, although some mills are running full on orders. Some weavers are running until 9 o'clock at night to get out orders for immediate delivery. Where orders are placed, buyers want immediate delivery.

The mills best employed are those making the dressed worsted cheviots and serges. It is easy to see that some of the weavers are slow and are making no goods by the way dresser spools are be-

CATLIN & CO.,
YARNS.
67 Chauncy St., Boston
316 Church St., New York.
906 Chestnut St., Philadelphia.

Walcott & Campbell Spinning Co.
FANCY HOSIERY YARNS
IN ALL COLORS.
New York Mills, Oneida Co., - N. Y.

E. JENCKES MFG. CO.
Colored Cotton Hosiery Yarns, Double and Twist Yarns for the Weaving Trade.
PAWTUCKET, - R. I.

TUCKER & COOK MFG. CO
MANUFACTURERS OF
WHITE AND COLORED COTTON WARPS
Nos. 6s to 30s,
On Beams, Jack Spools or in Chain
CONWAY, MASS.

GRANT YARN CO.,
COMBED AND CARDED COTTON.
YARNS 40s and above. AND
FITCHBURG, MASS. WARPS

COTTON, WORSTED, WOOLEN, MERINO AND FRENCH SPUN YARNS
Mercerized Cotton a Specialty
Write for Samples.
E. A. MORGAN & CO.,
54-56 Franklin St., N. Y. City.

EICHMANN & STERNBERG
530 Broadway cor. Spring St., NEW YORK.
Mercerized, Turkey Red, Gassed } Cotton Yarns.
Jacquard and Harness Twines.

C. MOORE & CO.,
MANUFACTURERS OF
TWINES, THREADS AND YARNS.
Jacquard Harness Twines of all kinds on hand and made to order.
S.W. COR. FIFTH & MARKET STS.,
Philadelphia.

HOWLAND CROFT, SONS & CO.

LINDEN WORSTED MILLS.

Fine Worsted Yarns

OFFICE AND MILLS:

Broadway and Jefferson Ave., Camden, N. J.

Represented by FIRTH BROADHEAD,
937 Banigan Building, Providence, R. I.

ALLEGHENY WORSTED MILLS,

Thomas Wolstenholme, Sons & Co., MANFRS. OF

Worsted YARNS,

ALL NUMBERS SINGLE AND TWO-PLY,

Sell Direct,

on Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural & Fancy Mixes

Office and Mills: Frankford Ave. and Westmoreland St., Phila., Pa.

CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns — white or colors, in skeins, on spools, cones, or shuttle bobbins.

NOVELTY YARNS — of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making Yarns **only.**

CENAPPED YARNS of all kinds. Doup Yarns. Harness Yarns. For Braids, etc.

...Dyers of Yarn and Slubbing...

BRISTOL, R. I.

FRENCH SYSTEM. BRADFORD SYSTEM

B. F. BOYER CO.,

MANUFACTURERS OF

Worsted and Woolen Yarns

OFFICE AND MILL: Delaware and Cooper Streets. CAMDEN, N. J.

Albert Herbst & Co.,

EMERALD WORSTED MILLS,

East Allegheny Avenue,
Emerald and Wishart Sts.,
PHILADELPHIA, - PA.

MANUFACTURERS OF

Worsted Yarns

FOR KNITTING AND WEAVING.

MALCOLM MILLS CO.,

MANUFACTURERS OF

Novelty Yarns, Silk Noil Yarns, in Fast Colors AND White.

Mills, Frankford, Pa. Office, 229 CHESTNUT ST., PHILA.

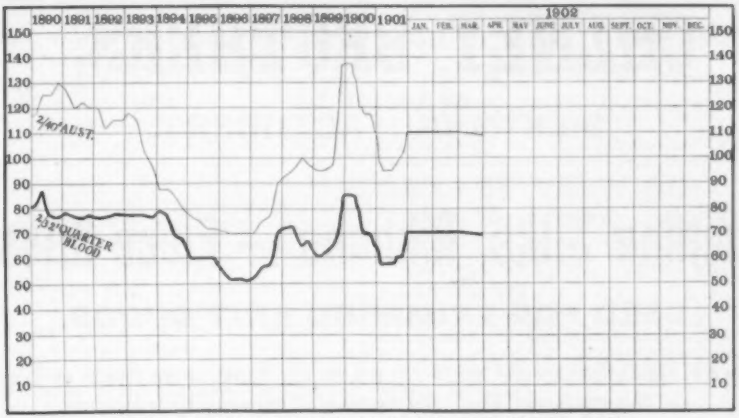


CHART SHOWING RANGES OF PRICE OF WORSTED YARN.

ing returned. The clay worsted business is showing a decided slow-up, and it is feared by some that clothiers and jobbers are able to import this cloth from Europe. This state was feared some time ago, when spinners advanced yarns unreasonably.

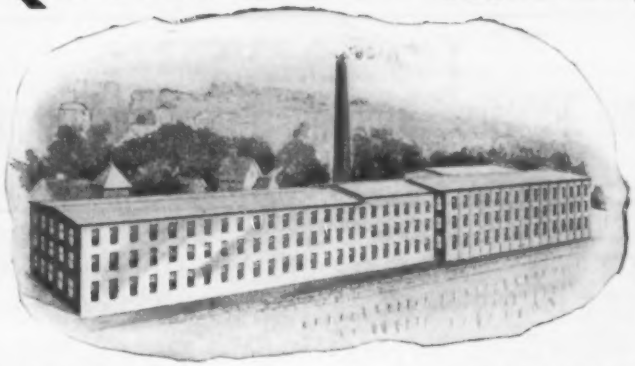
The fancy worsted mills are running slowly and are waiting for the clothiers to get orders. The present is a transitory period; new methods are being employed, and the buyers are taking as few chances as possible, buying only after orders have been secured. Sample pieces are bought, suits are made, and the style that sells gets the orders.

In meantime machinery must wait until the last moment and then comes the grand rush, and grand boom which "busts" later. This has been the experience of manufacturers year after year, and yet no one profits by that experience.

We have no doubt, if weavers were asked about the price of worsted yarn, they would say there was a drop of 5 to

SILK NOILS AND SILK NOIL YARNS
IN WHITE AND COLORS.
MOHAIR LOOPS, KNOTS, AND FANCY YARNS FOR DRESS GOODS AND CLOAKINGS.
A. T. SKERRY & CO., 47 LEONARD ST., NEW YORK.

QUEENSBURY MILLS,
FLYER SPUN



MOHAIR TOPS AND YARNS FOR WEAVING.
LUSTRE YARNS FOR SERGE LININGS.
Worcester, Mass.

CHENEY BROTHERS,

SILK MANUFACTURERS.

ALL KINDS OF

Knitting Silks, Ribbons AND Piece Silks,

USED FOR TRIMMING KNIT GOODS.

TRAMS, ORGANZINES and SPUN SILKS, in the Hank, or on Spools or Cones, for Manufacturers' Use. Silk for Special Purposes Made to Order.

MILLS: South Manchester and Hartford, Conn.

SALESROOMS: 477, 479 and 481 Broome Street, NEW YORK.
929 Chestnut St., PHILADELPHIA.
79 Chauncy Street, BOSTON.
186 Franklin Street, CHICAGO

WILLIAM RYLE & CO.,

DEALERS IN

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Foreign and domestic

SPUN SILK YARNS AND NOILS

Importers of European and Asiatic Raw Silk.

54 Howard St., cor. Mercer St., - NEW YORK.

F. C. BARTON,

Manufacturer of

Narrow Fabrics, Ribbons, Tapes and Bindings

FOR THE MANUFACTURING TRADE.

Telephone, 2520 Franklin. **54-56 Franklin St., NEW YORK.**

FIRE HOSE CORDS { From long staple cotton—6s to 20s yarn in 2 to 100 ply—16 lbs. without a knot.

COTTON WARPS { On beams—single or ply yarns, grey, bleached or colored.

GLAZED YARNS { All plys—any color—for braiders, harness and sewing threads.

UNIVERSAL WIND { For braider cops—warp yarns—grey or colored—2 inch to 12 inch traverse.

Dyeing facilities are new and best quality work guaranteed.
We are prepared to dye yarns for other parties.

WHITTIER MILLS, Selling Office, Springfield, Mass.
Mill, Chattahoochee, Ga.

6 cents per pound. This may be so from the top and fancied price of the latter part of the season, but it is not so when taken from the price at which most of the orders were taken.

We say that prices are evenly maintained, taken from the commercial standard and not from the speculative side of affairs. There is no mistaking the fact that many spinners are anxious and are wondering where the future orders are to come from, but the change will be quick and spinners will all be well employed as soon as trade starts, as there are no accumulations of yarn or cloth, and the production has been decreased through strikes.

Some of the mills are figuring on securing large orders through the default of deliveries through these strikes, and the saying that "It is an ill wind that blows no one some good" is being exemplified in the present condition of affairs, and later there surely will be a great hustling for goods of all kinds.

The French yarn spinners continue busy, making yarn for men's and ladies' wear; but they are getting but few orders from the knitters.

There was much merino worsted placed by the knitters in November last, but these orders have not yet been delivered. The hosiery manufacturers are doing a slow business and the finer class of goods requiring all worsted yarn is in small demand.

The demand is for better hosiery at a cheaper price, and the manufacturers are substituting merino worsted for all worsted hosiery and the trade is satisfied, the only trouble being that those who have not caught on are wondering why they are getting no orders and why they are being undersold. The buyers are happy; they are getting better hosiery at cheaper prices.

Top manufacturers continue busy with orders which will keep them all occupied until June. The better grades are selling best. Said one large spinner: "We cannot get tops fast enough. We had at the beginning of our year a surplus of 700,000 pounds tops, and that surplus has been reduced 500,000 pounds with all our machinery running." It is easily seen that the top combers will be in no position to fill immediate orders. We think that business is all right and the present is only the natural condition which exists each spring.

Prices:—

2/40s Australian	1.10
2/40s XX Delaine	1.02½
2/40s Half Blood	.95
2/20s Half Blood	.82
2/36s ⅜ Blood	.75
2/26s ¼ Blood	.68 to .70

TRY OUR
Silkine also Lisle Silk
FINISH
For Hosiery, Knit Goods, Yarn, Fast Black, Harsh Colors and Fibres.
O. K. SOAP CO., 968 Franklin St., PHILA.

DEXTER YARN CO.
Cotton Yarns in Cops, Cones and Skeins; on Beams or Spools, Single and Twisted. Cable Cords and Twines.
PAWTUCKET, - R. I.

RICHARD CAMPION,
Selling Agent for—
Bristol Worsted Mills,
Highland Worsted Mills.
17 Bank Street, Philadelphia, Pa.

WOOLEN and MERINO
YARNS.
EATON RAPIDS WOOLEN MILLS,
Eaton Rapids, Mich.

JAMES SPEED,
WORSTED and WOOLEN
YARNS
A SPECIALTY.
ALSO TOPS.
170 SUMMER ST., BOSTON.
Long Distance Tel. 4168-2 Main.

WOOLEN AND MERINO YARNS,
1 to 10 Runs, at reasonable prices.
All Wool, Mohair and Wool Spun or Mixed Cotton and Shoddy Yarns, in white, gray and colors.
Dress Goods Yarns a Specialty.
E. M. ROCKWELL,
Leominster, Mass.

J. BROADBENT & SONS,
WOOL SPUN YARNS.
YARNS FOR FLEECED LINED, and general Knit Goods our specialties. Equipment first-class. Prices low. Custom work of any kind. Get our figures.
UNIONVILLE, CONN.

FOR SALE.

COTTON WASTE,
Card Strips, Oily Card, Peeler, Sea Island and Egyptian Comber.

MANUFACTURER OF

Wool and Cotton Mixed Shoddies,
Camel Hair, Natural and White.

BUYERS of all kinds of hosiery and woolen and cotton Mill Wastes.

Chas. W. Becker, Agent, Amsterdam, N. Y.

SHODDY WM. H. H. SLACK & BRO.,
Springfield, Vt.

Carbonized Stock a Specialty. **FLOCKS**

M. B. SCHWAB, Pres. H. RAWITSER, Treas. ED. GLUECK, Sec. and Gen. Mgr.

RIVERDALE WOOLEN COMPANY,
MANUFACTURERS OF
SHODDIES OF EVERY DESCRIPTION.
CAPACITY 7,000,000 POUNDS PER ANNUM.
CUSTOM CARBONIZING AND GARNETTING A SPECIALTY.
RIVERDALE, NORTHBRIDGE, MASS. New York Office: 140 Duane Street.

WE BUY FOR SPOT CASH any Kind or Quantity Jobs of Woolens and Dress Goods. Seconds, Remnants, Odds and Ends a Specialty. **Drop us a line and we will call.**

H. & D. FEINGOLD, 89 & 91 Bedford St., Boston, Mass.
Telephone, Oxford 1431-2.

Woolen Yarn.

Spinners continue busy with orders which will last until May or June. The demand coming from varied sources shows that the business is not confined to particular branches.

The overcoating manufacturers have orders for cloth which will run them until August. These manufacturers in many instances are short of spinning machinery, and in busy periods place many orders with the spinners and thus spinners have many orders from these manufacturers. The elderdown and French flannel manufacturers are also producing much cloth and are giving many orders to the spinners.

The rubber boot lining trade is absorbing large quantities of cheap woolen spun yarn, paying as low as 18 to 19 cents per pound. Many spinners are unable to understand how these prices are reached, while others would like as many orders as can be secured at these prices.

The hosiery trade is again demanding a better grade of hosiery at prices less than last year. More hosiery made from woolen spun yarn is the result, and knitters are producing the smooth worsted effect by using long stapled wool, thus avoiding the use of worsted. Many orders on which spinners have been running were taken in the latter part of the year and the spinners who secured orders at that time are the favored ones now. No new customers can be supplied for immediate delivery. For future delivery some of the spinners are able to book orders.

The very fine and the very cheap grades of hosiery are dull. The demand is all for the medium grade at a price less than last year.

The knitters of underwear are getting but few orders for heavyweight underwear, although the mills manufacturing fine lightweight garments have many good orders. The orders for heavyweight manufacturers are accumulating; until a sufficient number of orders have been

received, the knitting mills will not start production, and then will be produced in the quickest possible manner.

It has lately been the custom with some knitters in order to keep machinery running to spread orders over the longest period possible in the hope that before the season was over further orders would be forthcoming and the mills operated profitably. These manufacturers state that this season they will push orders through as quickly as possible and then stop production.

There have been some large orders placed by the Government and the competition has been sharp. The successful bidder secured the order and beat the next nearest bidder by less than ½ cent per garment. Some knitters say they do not know who is to be congratulated the most, the knitter who got the order or the knitter who lost it. The demand for thread waste continues, with prices ranging from 55 to 62 cents per pound. Lamb's wool is in demand, with prices ranging from 70 to 72 cents per pound. There is very little offering at this time in comparison with the demand, and prices are well maintained, although from all reports knitters are securing but few orders.

Salesmen traveling through Connecticut during the last week in March secured no orders. The dealers are holding the prices of wool very firm, and are allowing cash offers to leave their places without acceptance. This shows the strong condition of the Boston wool market. Dealers state that they are glad for the lull in business, as it will enable them to buy the new clip to better advantage than would have been the case had the strong market continued.

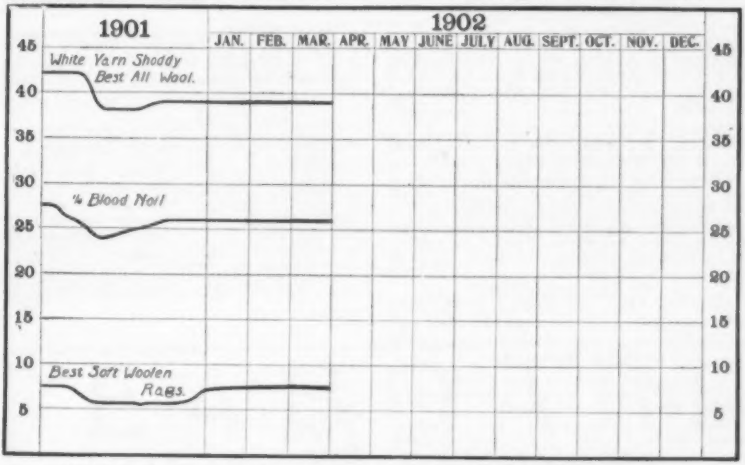


CHART SHOWING RANGE OF PRICES OF SHODDY, RAGS AND NOIL.

Shoddy Market.

The month just past has been a busy one for shoddy mills. Quotations are about the same at this writing as at the beginning of the month, though buyers have been less anxious to take up stock during the last week.

Cancellations in any part of the goods market almost always have an unsettling effect and this together with the softening of certain grades of rags have probably had much to do with the present situation.

The rush for new black fine worsted has in no way been affected by the above, and owing to the scarcity of this and one or two other fine grades will remain with practically no limit for the higher quotation.

The outlook today is for a good, conservative business during the next month, beginning as soon as the market has steadied itself a little.

NOILS AND WOOL WASTE.

The condition of this market is extremely dull and scarcely any noil or waste is moving. The medium grades continue to pile up and the chances of a change in the near future seem very slight. The quietness of the wool market undoubtedly has its effect also. Quotations remain the same more from lack of business than from any other cause.

Cotton wastes remain unchanged as to quotations and lots are moving very slowly.

RAG MARKET.

The slight softening in certain lines in this market is due to the fact that many dealers have continued to buy before they realized that their customers had ceased for the time being to be interested in the lower grades of stock. This action on the part of the buyers has been so general and exactly timed that an outsider might consider it preconcerted. In the face of this conidtion fine stocks are held at practically the quotations of several weeks ago, and show no indication of falling off. In fact, it is difficult to buy some of these at the figure quoted.

These slight irregularities do not affect the general outlook and a good season's business will probably be transacted.

SHODDIES AND EXTRACTS.

White yarn, best all wool	38-40
White knit, all wool, best, fine	28-30
White knit, No. 2	25-28
Light yarn, extra fine	25-28

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Cotton Waste Purchased on Yearly Contract from Mills.

New pure indigo blue	23-25
Fine worsted, new black	26
New blue clip, best, fine	20-22
Dark mixed yarn, extra fine	22-24
All wool yarn, medium and coarse grades	15-20
Merino.	
Fine light, all wool, No. 1	24-25
Medium light, all wool, No. 1	16½-17½
Medium light, all wool, No. 2	14-16
Fine black, all wool	20-22
Fine dark, all wool, best grade	17-18
Medium dark, all wool, No. 1	13-15
Medium dark, all wool, No. 2	12-13
Red knit stock, strictly all wool	19-20
Red flannel, all wool	19-20
Dark blue for hosiery, strictly all wool, No. 1	17-20
Dark blue for hosiery, not all wool, No. 2	12-14

DELAINE EXTRACTS.

Light	17-19
Medium light	15-17
Regular gray	12-13
Black	14-15
Fancy colors	16-20

WOOLEN RAGS.

Fine merchant tailors, all colors	8-9
Choice light colors	12-14
Browns	12-13
Blacks	9-10
Fine blues, plain	10-11
Fine dark	10-11
Medium dark	6½-7½
Worsteds.	
Blue	15½-16½
Black	20
Serges.	
New blue	15-16
New black	15-16
Flannels.	
New scarlet	18½-22
New blue	17-18
Cloakings	3-4

SOFTS AND KNIT STOCK.

Soft woolens, best	6½-7
Old white flannels	17-18
White flannels, No. 2	11-12
Old red flannels	8½-9
Light blue flannels	6½-7½
Old blue flannels	6-7
Old plaids	5-7
White stockings	17-18
White hood stock	21-22
Clear hoods	7-8
Red stockings	7-8
Blue stockings	7-9
Fancy stockings, No. 1	7-9
Gray stockings	8-9
Black stockings	9-10
Knit stock comforters	7½-8½
Red knit	8½-9
Light gray knit	8-9
New light fancies	14-15
New fancies	11-12
Merinos.	
Light, fine	14-15
Light, coarse	7-8
Fine dark	9-10½
Dark, No. 2	5-6½
Coarse dark	4½-5
Blue	10-11
Blue—seamed	14-15
Black—unseamed	10-11
New black	18-20
Small	2½-3½
Bunting	6-8

NOILS.

Australian	48-55
Fine domestic	40-45
½ Blood	35-40
⅜ Blood	29-32
¼ Blood	25-27
Braid	22-25
Carpet (white)	14-18
Carpet (colored)	10-12½
Seedy.	
½ Blood	25-30
⅜ Blood	20-25
¼ Blood	17-22

FLOCKS.

Shear, fine white, all wool	10-12
Fine indigo blue, all wool	9-9½
Fine black, and blue, all wool	7½-8
Fine dark, all wool	6-6½
Gig, fine, all wool	3-4
No. 1, black, all wool cut	6-7
All wool, fancy, shear and gig	2½-3½

COTTON WASTE.

No. 1 Spinners	7
No. 1 Machine	4½-5
No. 2 Machine	4¼-4¾
Machine Cop	5-5½
No. 1 Cop	4½-5
No. 1 Card	6-6½
No. 2 Card	3-3½
No. 1 Oily Card	2½-3
No. 2 Oily Card	1-2½
Egyptian Card	6¾
Peeler Combing	7-7½
Egyptian Combing	7-7½
No. 1 Linters	3½-4½
No. 2 Linters	3-3½
White Clips	4-5
Colored Clips	2-2½
No. 1 Picker	1¾-2½

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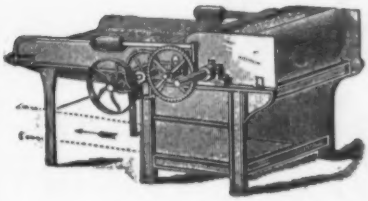
ATHOL, MASS.



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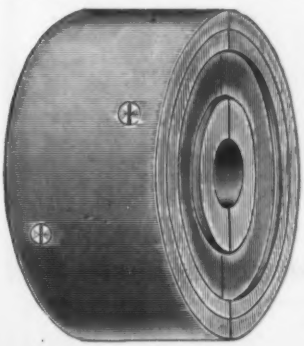

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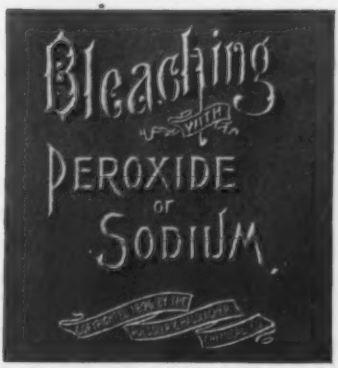

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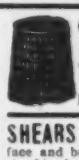

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I make Kettle Sticks, Dry and Sulphur House Poles, also Sticks to suit the Wolstenholm Machine from natural water grown Cedar. I also make Sticks to suit the Klauder, Weldon, and Lorimer machines, singed or plain, with or without copper ferules. Square and flat Drying, Bleaching and Sulphur poles from finer grades of lumber. Poles for rolling rugs on, etc.
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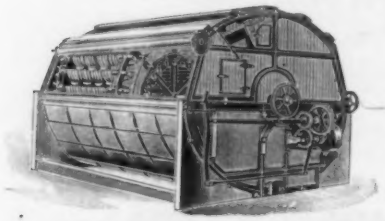

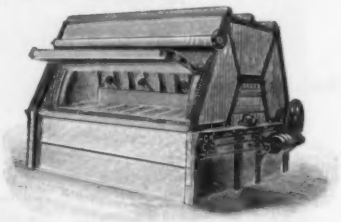

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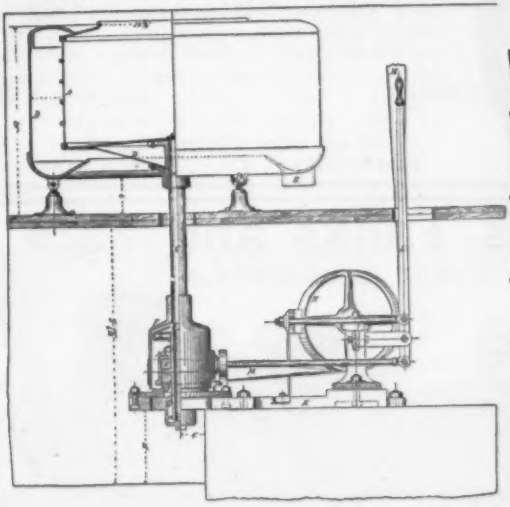

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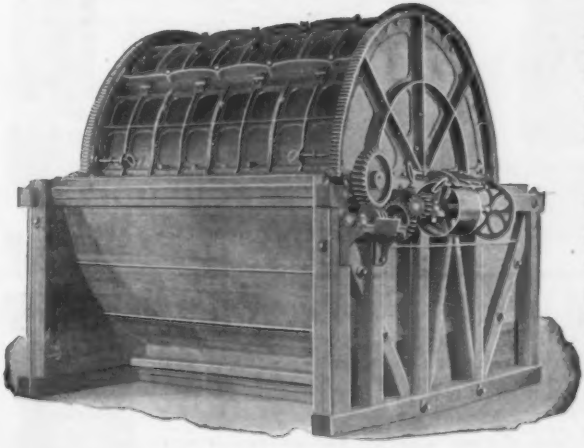

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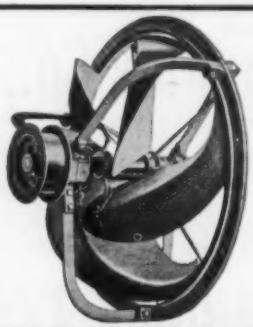

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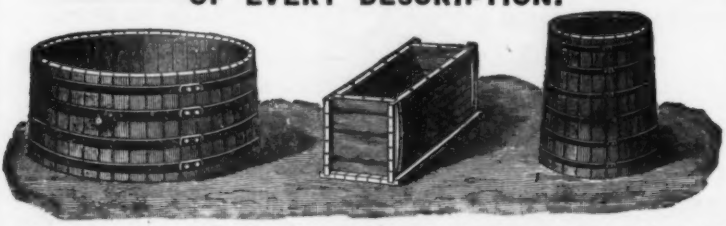

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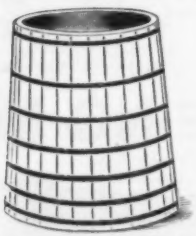

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Now April with its showers sweet
Starts nature forth its friends to greet;
The Berry Wheel is not amiss
For drying, e'en in air like this.

TRY ONE. **IT PAYS.**

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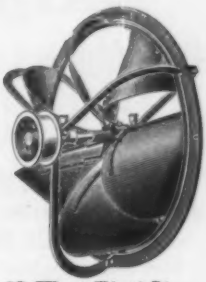

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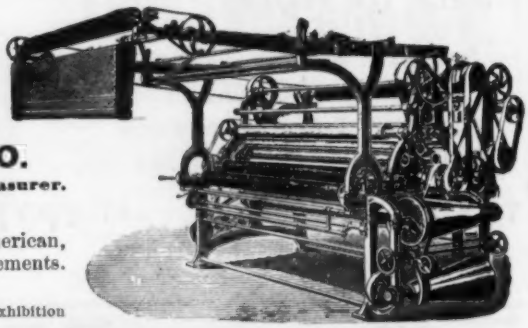

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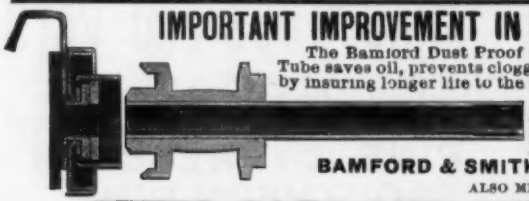

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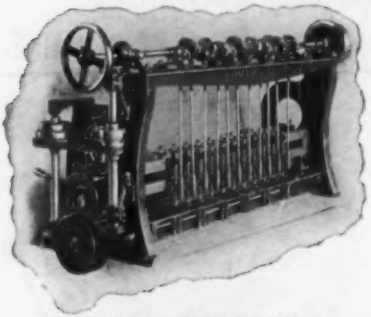

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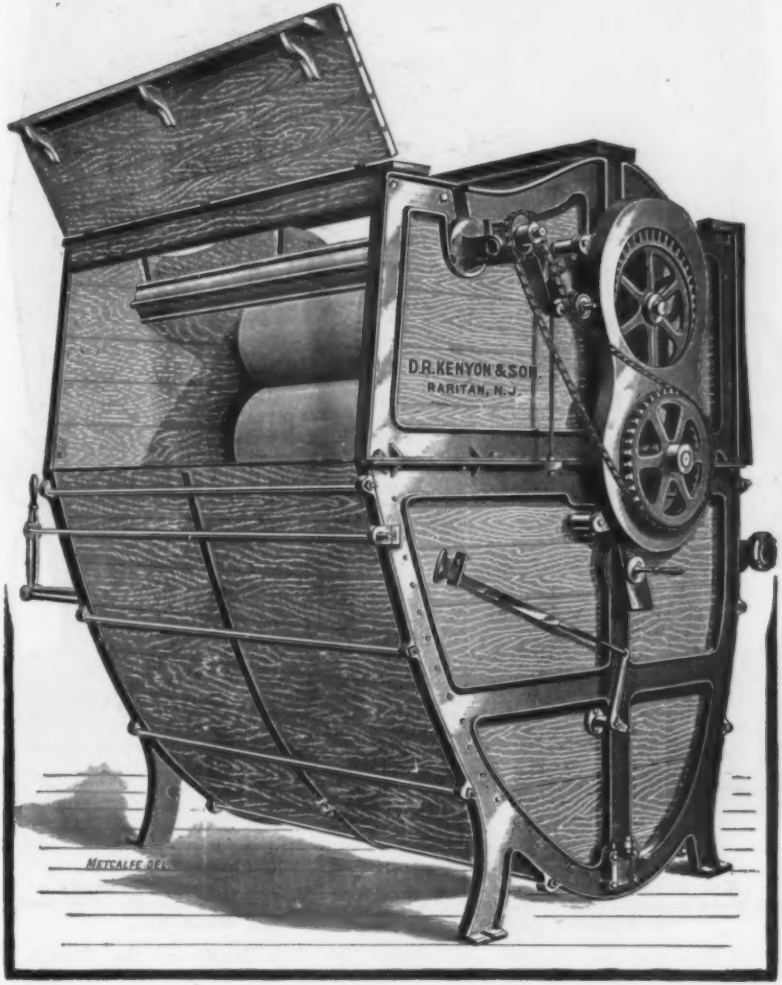

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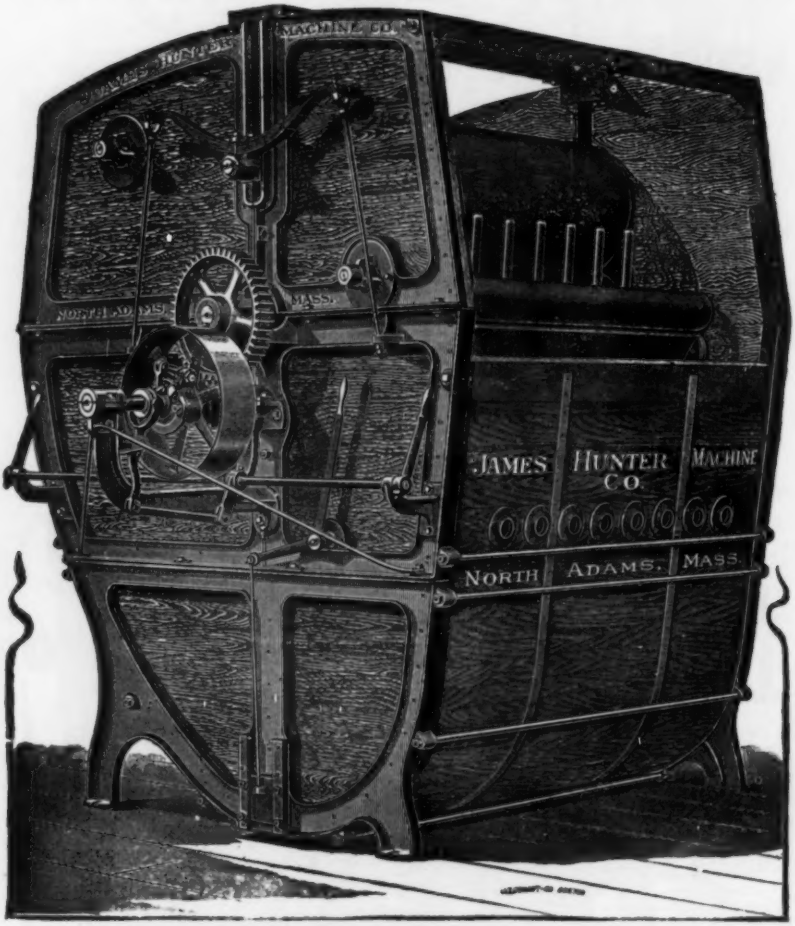

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For Four, Six and Eight Strings of Goods.

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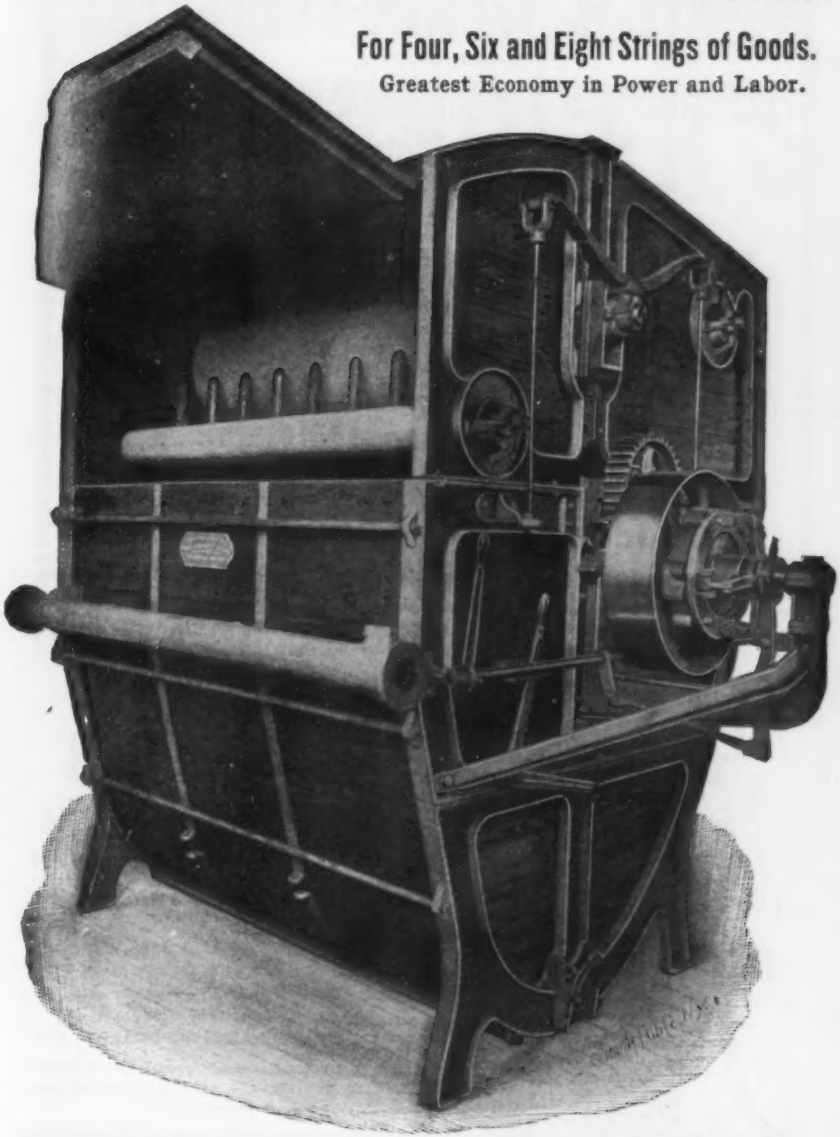

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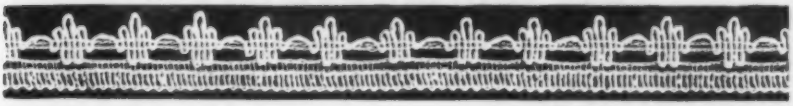

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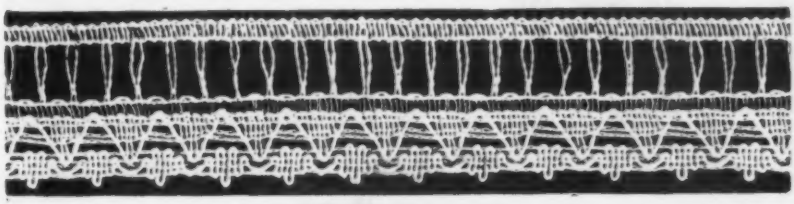

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A MACHINE OF THE HIGHEST GRADE.

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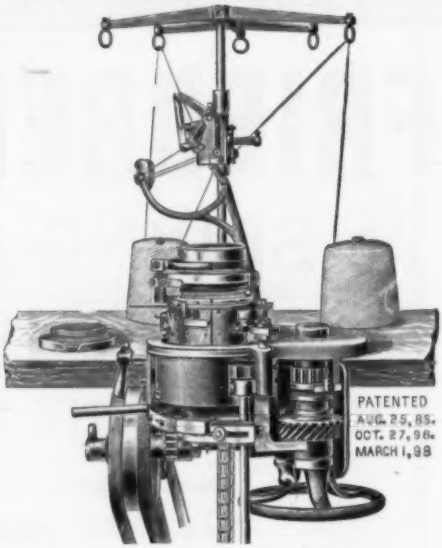

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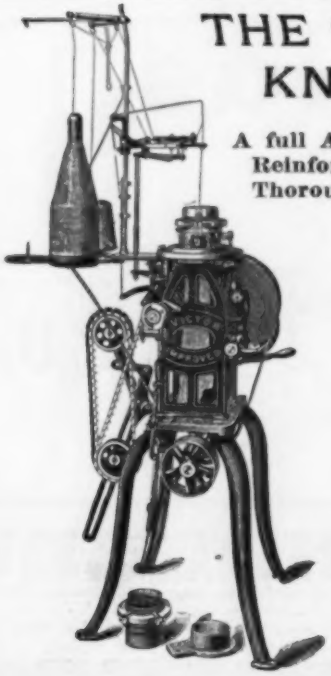

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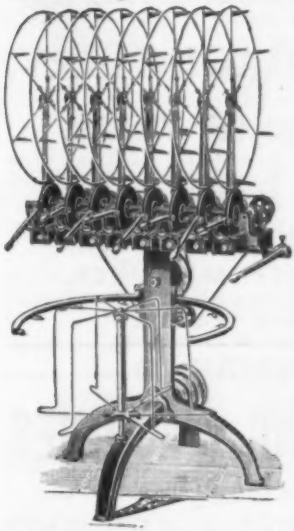

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New and Second Hand.

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UNEXCELLED MACHINERY FOR RIBBED UNDERWEAR,

Sweaters, Bathing Suits, Toques and Specialties, with or without Automatic Stripers and Designers.

These machines have the **only absolutely perfect Take-up Device** Depends neither on springs, friction, ratchet, nor state of weather for its efficiency.

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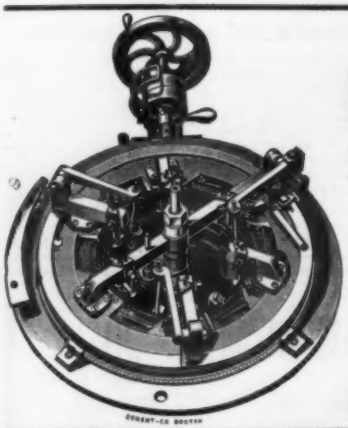

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KNITTING MACHINES

Either plain or full automatic, with stop motion complete, for

RIBBED UNDERWEAR,
SWEATERS,
CARDIGANS,
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The Leighton Circular Machines are the only ones which **Rack** or **Shog** the needles for fancy borders; also built for automatic striping; and with from 4 to 16 feeds for underwear.

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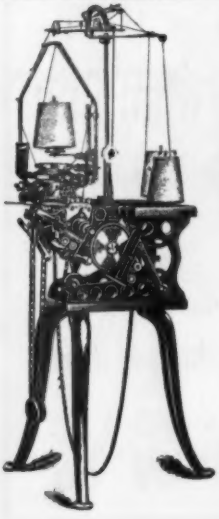

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Regular 7-8 Automatic for all classes of Cotton Hose. Special 3-4 Automatic for Wool.

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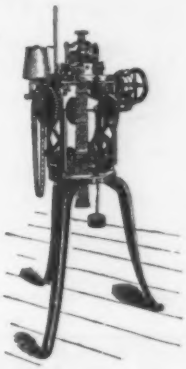

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Carefully designed and well made with Solid Forged Steel Cylinders and Dials, Segmental Cam Rings, Encased Take-up, Stop Motions, etc. Standard Sizes, Reasonable Prices. Also

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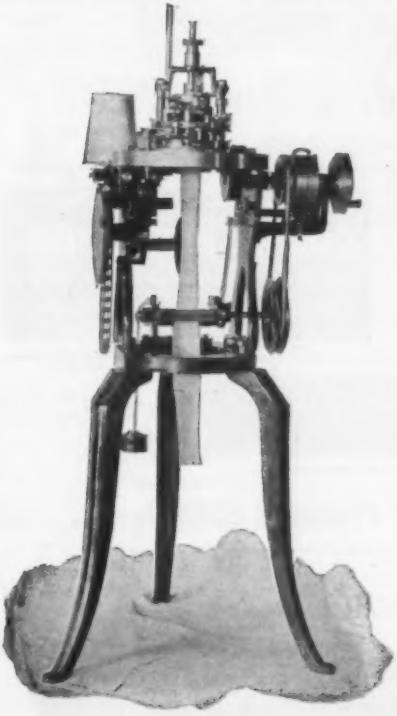

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For All Kinds of

HOSIERY AND UNDERWEAR

Entire New Design Ribber.
Protected by Patents
granted and others pending.

Excels in Quality of Fabric and Ease of Operation, Simplicity and Durability.

COSTS LESS MONEY.
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Absolute Guarantee With Each Machine.

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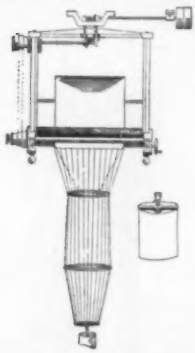

PEACE ON EARTH, GOOD WILL OF ALL.

You will have both if you buy the

JOHNSTON PATENT VERTICAL TUBULAR CLOTH DRYER.

"It saves ROOM, TIME and MONEY; does MORE and BETTER WORK than any Dryer known."—Verdict of superintendent of one of the largest Knit Mills in the State of New York.

Send postal card for Circulars and Price List.

Sole Owner and Manufacturer **E. M. ANTISDEL,**

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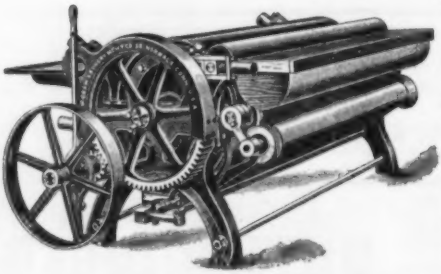
AUTOMATIC IRONING AND PRESSING MACHINE FOR KNIT GOODS.



This machine irons and presses ribbed and flat underwear, giving a fine smooth finish and most attractive appearance to the goods, not to be obtained in any other way. It does not break buttons. Inexpensive and easy to operate, and has large capacity. Knitting mills using them are greatly pleased with results. This method of finishing is sure to come into universal use. Send for further particulars to

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PATENTED JANUARY 7, 1896.

The only Perfect Stamp for Hosiery, Underwear and all Woven Fabrics.

Blocks for Printing Hosiery.

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HOSIERY FINISHING BOARDS.

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FOR ALL KINDS AND GAUGES OF SEAMLESS HOSIERY.

Has the preference wherever used over 7-8 and full automatics. Because it makes as much or more goods and better goods. Costs less for repairs. Gives less trouble to fixers Range on Half Hose, from the coarsest to 220 needle.

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Cylinders and Dials for all size machines.

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Stays, Facings, Bands, Suspender Straps, Etc.

The Best. Built like a sewing machine. Guaranteed.

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Our New Improved Light-Running Short Carriage

KNITTING MACHINE

unsurpassed for full-fashioned Sweaters, Jackets, Leggins, regular Knit Underwear, Union Suits, and all other *regular* and *selvage* Knit Garments. Made with 2 complete yarn-carriers and 2 color striping attachment and has the new combined Sweater Stitch Drop Lock and Tubular Lock. Special Glove Machines. Finger Knitting Machines 3 inches width of needle bed. Rapid 2-thread Lock stitch Overseamers.

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Business est. in 1859.

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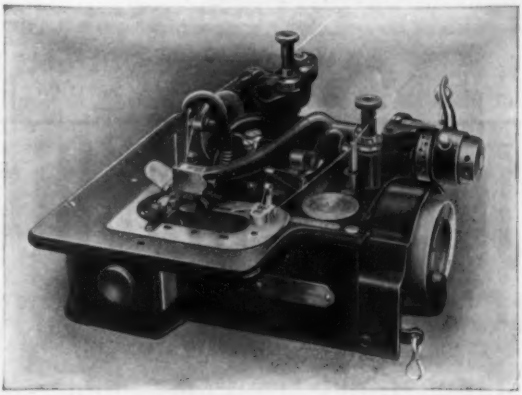
"OVERLOCK" MACHINE.

(TRADE MARK.) (Pat. Apr. 5, 1892.)
(Patent twice upheld by U. S. Court of Appeals.)

For TRIMMING, SEAMING, and OVEREDGING (or HEMMING) KNIT UNDERWEAR.

3,000 STITCHES PER MINUTE

12 to 20 STITCHES PER INCH



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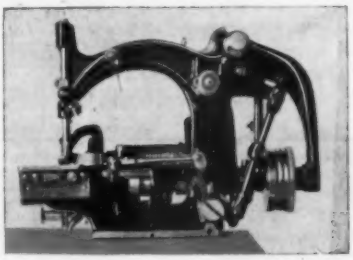

Overedge Welting Machine, with Trimmer.
The very best in the market.
(No royalty.)

Overedge Seaming Machine, with Trimmer.
3000 stitches per minute.
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Overedge Sewing Machine, without Trimmer.
For manufacturers of knit goods and other fabrics, with or without trimmers.

Our claims are SIMPLICITY,
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Every part of our machine being readily accessible.
This machine has 100 less parts than any other overedge machine.

THE CHEAPEST AND BEST METHOD

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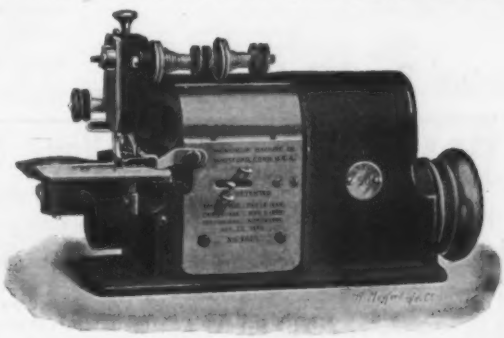
Blankets, Skirts or Cotton Goods,

requiring a useful and Ornamental Finish, should be finished by some of our various machines adapted for special purposes and finishes.



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Single "Interlock" Machine

(Trade Mark.)

FOR OVEREDGING, HEMMING AND SEAMING.

Especially Adapted to UNDERWEAR AND HOSIERY.

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Elastic Seam, Hem or Edge Finish.

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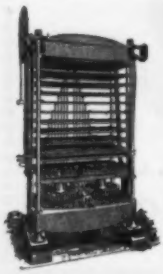
Plate Press



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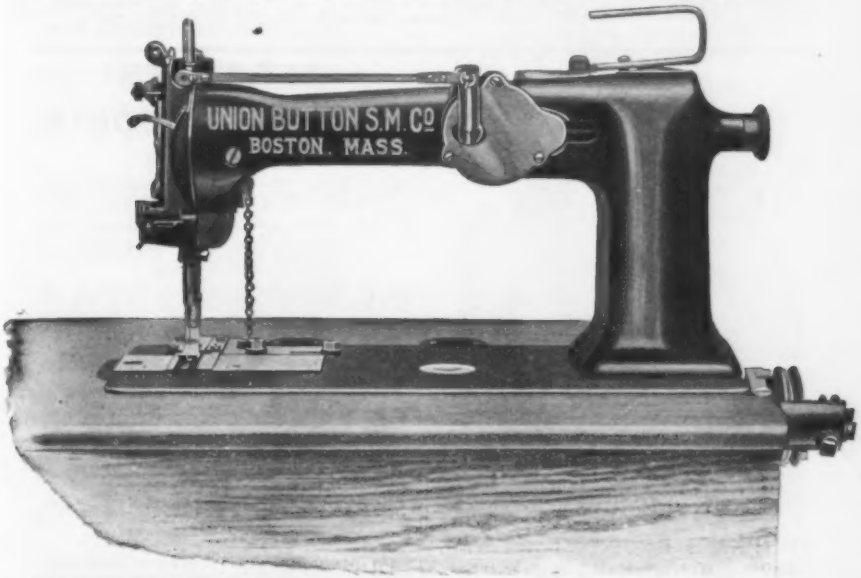

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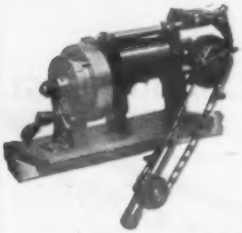

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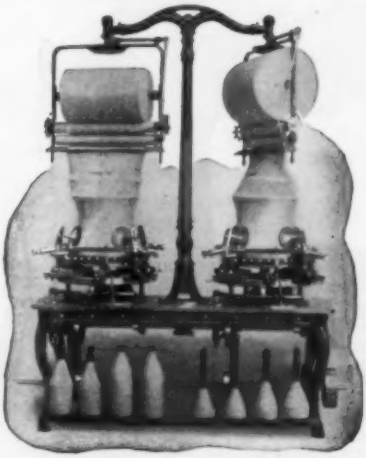

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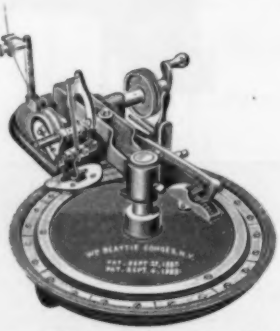

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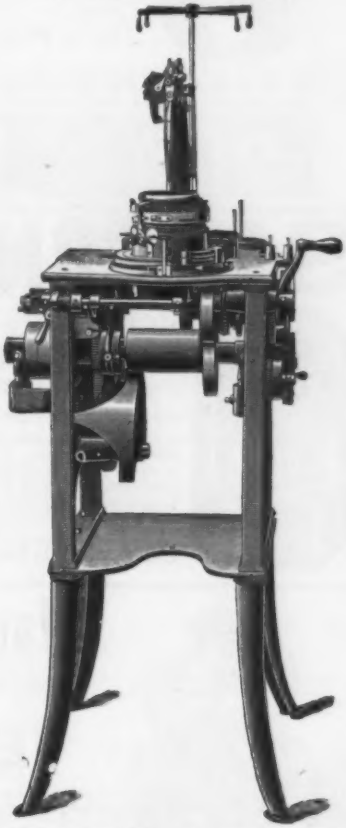

Best method of transferring ribbed legs and tops.

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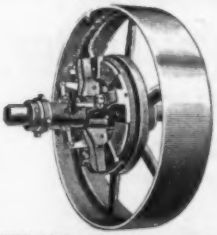

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have just those attributes, and we will be pleased to tell you about them if you will inquire.

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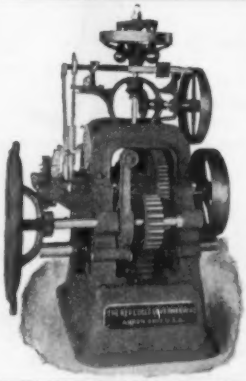

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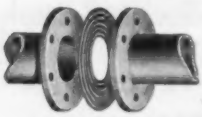

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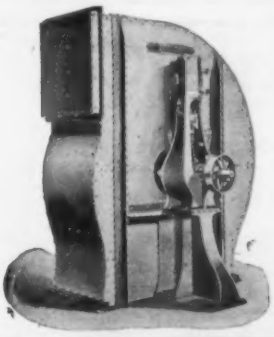

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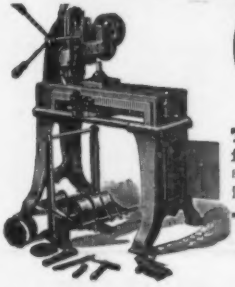

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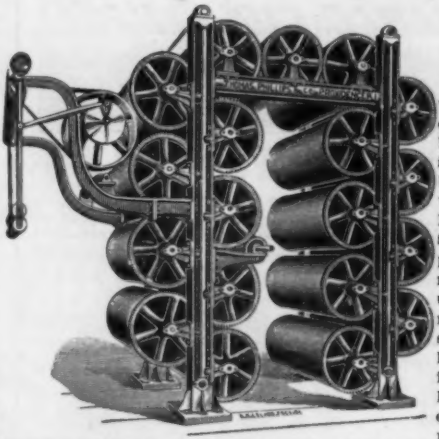
Drying and Finishing Machinery.



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The cut shows a 19-can machine with two tiers with intermediate can for continuous drying. We build any arrangement of stringing and furnish any desired number of cans, of any length, either with Phillips Steel Head or Cast Iron. We strongly advise our Steel Head Can. It is a big improvement as eight years' experience has demonstrated. This upright machine enables cloth to run without wide intermediate spaces between the tiers, as in horizontal machine, thus avoiding "scrimps." We also build Horizontal Frames, but on radically different principles from most others. Our illustrated catalogue explains all these points at length and has many plates showing different styles of stringing. It may be had for the asking.

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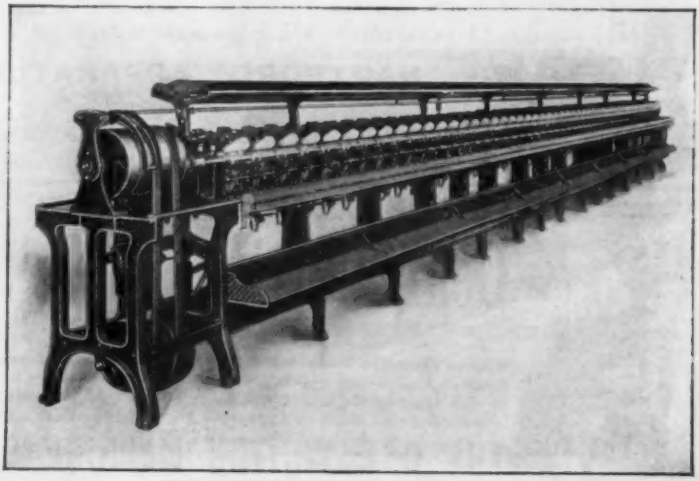

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Patented in United States and Europe.

Gives more production per operator than any other winder on the market. Even tension and speed. Yarn delivers direct from Cones to knitting machines without rewinding.

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DISCHARGED
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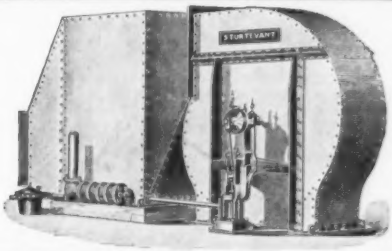
QUICKLY ABSORBS and renders invisible all moisture in the atmosphere of a bleachery or dye house.



IT ABSOLUTELY PREVENTS the formation of steam, keeps the atmosphere clear and increases the output of operatives. The excess of air pressure causes all leakage to be outward.

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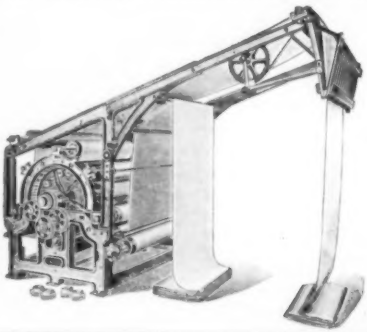

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